BALDNESS

AUSES, ITS TREATMENT
ND ITS PREVENTION

CHARD W MÜLLER, M.D.

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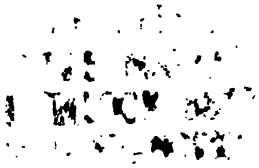
ITS CAUSES, ITS TREATMENT AND ITS PREVENTION



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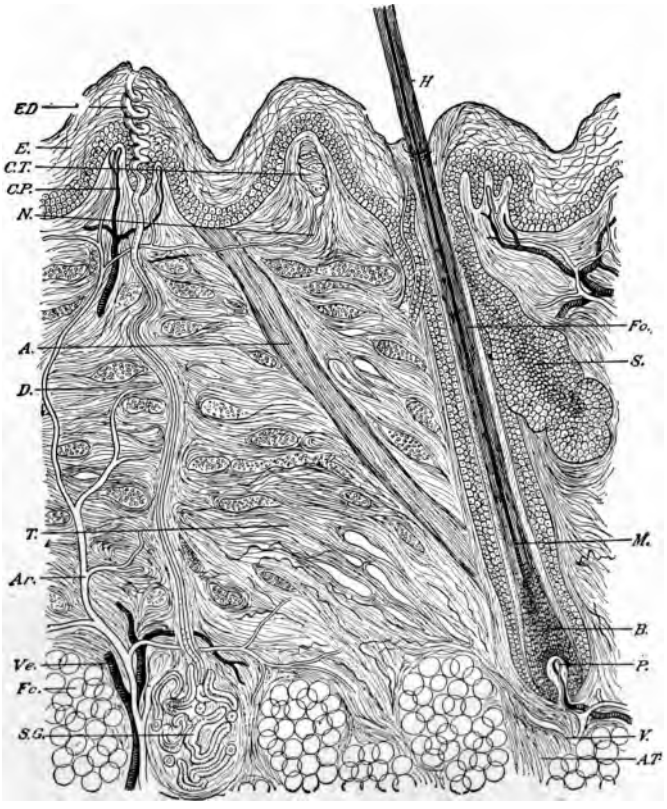

From Charles Heinzmann's "Atlas of Skin Diseases." By kind permission of Professor Louis Heinzmann.

General View of the Hair (in section) and Its Appendages

E.D—Excretory duct of sweat gland
E.—Epidermis; outer skin
C.T.—Corpusculum tactus, touch corpuscles
C.P.—Corpus papillare
N.—Nervus, nerve
A.—Arrector, or erector pili muscle
D.—Cutis or derma, true skin
T.—Tissue, subcutaneous
Ar.—Artery.
Ve.—Vein
Fc.—Fat cells
S.G.—Sweat gland
H.—Hair shaft
Fo.—Follicle
S.—Sebaceous gland
M.—Marrow canal
B.—Bulb
P.—Papilla
V.—Vessels or nerves
A.T.—Adipose tissue

BALDNESS

ITS CAUSES, ITS TREATMENT AND ITS PREVENTION

BY

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NEW YORK

E. P. DUTTON & COMPANY

681 FIFTH AVENUE

Printed in the United States of America

DEDICATION

Many people might be helped or comforted by timely advice and treatment from their family physician before being obliged to consult the hair-specialist, particularly those who lack the time, the opportunity or the money to take special treatment.

This work has been undertaken in the hope that it may arouse the general practitioner to take more interest in and have more knowledge of a subject which is of first importance to more persons than any but the specialist realizes.

In this hope this work is dedicated to my colleagues in the profession.

Richard W. Muller, M.D., A.M.A., Ac.Med.

NOTE

In the course of several years' endeavor to elucidate the many obscure points and debatable questions which still remain to be cleared up concerning the hair and its appendages, I have searched practically every volume on the subject of any importance in every modern language for suitable illustrations. Especially I acknowledge my indebtedness to such standard works as Rabl-Mraceck, Darrier, Koellicker, Testut, Geovannini, Rainforth and Stöhr. Personal permission was given to me by Sabouraud, the late Dr. Jackson, by Joseph and Gastou to use the very valuable material collected by them. Of this I have made full use and herewith gratefully acknowledge my indebtedness to these pioneers in the subject.

RICHARD W. MÜLLER, M.D.

INTRODUCTION

Physicians in general do not interest themselves enough in the small defects in health, the little things which, neglected, so often become the starting points for serious illnesses. We must remember that a neglected field in medicine is likely to become the camping ground for the ignorant and dishonest quack. Nothing that relates to the welfare of the body should be outside the province of medicine, and in fact the most alert professional men of to-day are concerned about feet and teeth and hair as well as about heart and lungs and circulation.

That one sees everywhere so many persons either partially or entirely bald in these days of knowledge among hair specialists as to its causes and its prevention, must arise either from the ignorance of the laity as to the progress recently made by science in this direction, or else from indifference. And yet the personal appearance is not a subject about which people are usually indifferent, nor should it be. Unfortunately, we are so often judged, rightly or wrongly, by externals, that it behooves every one to pay some attention to personal appearance. For men, it has really become a serious matter, for if one is bald even if young or if he is even gray, the superficial observer takes him for many years older than he actually is, which counts against him when seeking employment, for, forgetting the experience which added years may bring, the business man will have none but young

people in his employ. Therefore young men, take heart and hope, your case is not desperate; your appearance can be improved and your worldly prospects advanced by attending to these matters in time, and largely for your benefit these pages are being written. But not for young men alone, but for all, men or women, is there hope and help. Bald women are not often seen, but there are very many whose thinning locks cause them much concern and whose appearance and prospects are injured thereby. Not only baldness and thinning of hair may be cured or helped but gray hair as well, which is also found to be a deterrent when seeking employment, and by which young persons are also judged to be many years older than they really are.

The following pages will tell what science knows about the human hair, how to preserve it and how to prevent its falling out. The marvelous results following the use of light rays in the treatment of falling hair are fully and authoritatively set forth. It is no longer necessary for men and women to depend on the legends and traditions of barbers and hairdressers for information as to the prevention of baldness.

The study of the diseases of the hair and scalp has become one of the departments of scientific treatment (therapeutics) and it is supposed literally and figuratively true that a new and great light has been thrown on the whole subject.

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CHAPTER I

THE SCALP AND THE HAIR

All of the body is covered with hair to a greater or less degree, but in the scalp these hairs are thicker, far more abundant, with deeper roots and having a richer system of glands, nerves and blood-vessels.

In the infant the scalp covering is very thin, being covered, as we all know, by great numbers of downy hairs. Owing to the fact that the glands gape open externally and that the blood-vessels are in a dilated state the young child is much more exposed to infection of the scalp than is the adult. For this reason the hair of little children should receive very special care and no parasites should be permitted to gain a footing on the scalp.

In the adult man the hair has more of a "slant." It is oblique in tendency, the connective tissue of the scalp is thicker and sweat glands more numerous than the sebaceous glands. These sweat glands are very deep in the scalp of the man.

Women have deeper hair follicles and a greater supply of sebaceous glands than men.

In old men, the skin of the scalp is thicker, blood-vessels fewer, and the various glands (with the exception of the sweat glands) degenerate and shrink.

We should think of each hair as if it were a little plant growing on the scalp as in a garden. It is the

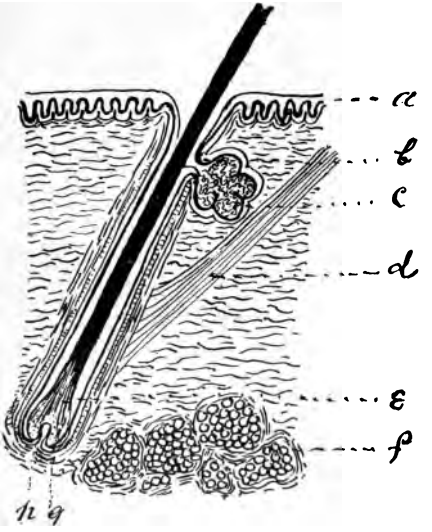

FIG. 1.—Hair, normal with its arrector or erector muscle. *a*, horny layer of the skin; *b*, mucous layer; *c*, papilla; *d*, erector muscle; *e*, hair follicle; *f*, fatty cells; *g*, hair bulb; *h*, hair papilla.

blood-stream which fertilizes this garden, and anything which interferes with the full normal feeding of the hair from the blood-stream is the cause of disease. Thus the hair is liable to degeneration from within because of diseases of the blood or nervous system. It is also, like all plants, liable to attack from without by parasites and disease germs. Like good gardeners, we must see that nothing interferes with

the feeding of the hair from the blood-stream, and we must also guard the hair growth from external attack.

USES OF HAIR

The hair has many uses.

It preserves heat.

It protects.

It is an organ of touch.

It enhances the beauty.

It helps to protect the head against blows.

As hair is a bad conductor of heat it preserves the heat of the body.

The eyebrows are a defense to the eye, and by turning the perspiration to the outside of the eye-socket, prevent its access to the eye.

In the same way the eyelashes, the hairs of the nostril and ears prevent dust and insects and all foreign substances from finding an entrance to these parts.

It is more apt to grow abundantly when its possessor is exposed to excessive heat or cold.

Those parts furnished with hair are more sensitive than those parts which are without it.

As an addition to the personal appearance it is scarcely necessary to speak, as every one will certainly agree that it improves the appearance; it softens the hardness of the features and helps to cover blemishes.

For all these reasons it is well worth preserving and preserving in good condition.

A. THE ANATOMY OF THE HAIR AND ITS APPENDAGES

Chemical Constituents. The chemical constituents of the hair as given by Waldeyer are as follows: One hundred parts of dry hair contain from 5/10 to 7/10 parts of incombustible material. This contains 23 per cent. of alkaline sulphates, 2 to 10 per cent. oxide of iron, and 40 per cent. silica. Dark hair contains somewhat more iron.

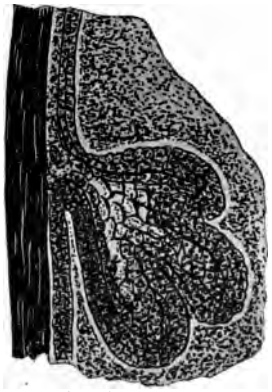

FIG. 2.—Showing sebaceous gland opening upon the follicle.

The analysis of the hair substance shows it to be composed of carbon, 50; hydrogen, 6.36; nitrogen, 17.14; oxygen, 20.85; sulphur, 5.

The hair is said to contain a certain amount of oily substance, its color varying with that of the hair.

The proportions of the chemical constituents vary with the color of the hair, thus, fair hair contains less carbon and hydrogen and more oxygen and sulphur, while brown hair gives the largest proportion of carbon and the smallest of oxygen and sulphur. White hair of the aged contains a considerable amount of bone earth or phosphate of lime.

The quantity of nitrogen is the same in all.

The Hair. In each follicle one or more hairs exist, either fully developed or in a downy, immature state.

The sebaceous glands open directly upon the sur-

face of the epidermis or on the follicle. The sweat glands are deeper down. The blood and nerve supply, common to the contents of the follicle, is nevertheless furnished to each individual part.

Structure of the Hair. The hair is a threadlike, horny structure, similar to the nails but soft and pliable.

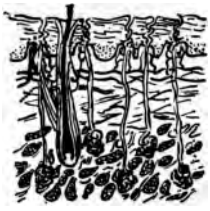

FIG. 3.—Here numerous sweat glands are shown deep down in the tissue.

Varying in length from an inch to a yard or more, its diameter ranges from 0.15 to 0.32 mm.

In form it is almost round, oval, kidney, bayonet-shaped or flat.

Its color may be white, blond, red, brown or black, with many variations.

It consists of bulb, hair root, hair shaft and point.

Its coverings are the medulla, cortex and cuticle.

The bulb—the lower extremity—is cup-shaped and fits over the upper part of the papilla like a ball and socket joint.

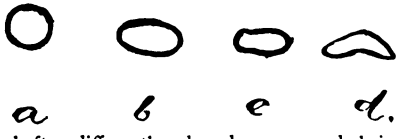

FIG. 4.—Hair shafts, differently shaped. *a*. round hair; *b*. oval hair; *c*. oval hair; *d*, kidney shaped hair.

The hair root—the part within the follicle—includes the bulb and extends from the bottom of the follicle to its mouth at the level of the skin.

The hair shaft is that portion of the hair which projects beyond the skin and terminates as a point.

The point at the upper end of the hair tapers to a needle-like end.

The hair has its papilla; the sebaceous giand has its supply of blood vessels in connection with that of the follicle; the sweat glands have a circulation all their own, which explains the possibility of trouble

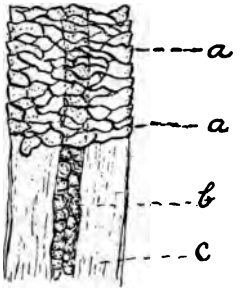

FIG. 5.—Section of hair shaft showing *a* cortex, *b* medulla, *c* cuticle.

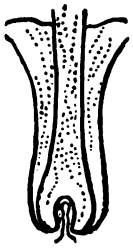

FIG. 6.—This little sketch merely shows the cup-like end of the hair shaft fitting accurately over the papilla.

arising in each distinct and separate part of the follicle, or in all of them combined.

The anatomical relations and the vascular connection of the elements composing the hair lobule explain the reaction of disease of one unit upon the other units and the secondary extension to the entire combination.

The relation with the adipose cellular tissue (fatty layer of the skin), the connection with the vasomotor nervous system, which controls the blood supply, explains those organic or visceral reactions, either diffuse or localized, be it by the influence direct from the vasomotor nervous system upon the papilla, or by indirect action influencing the quantity or quality of

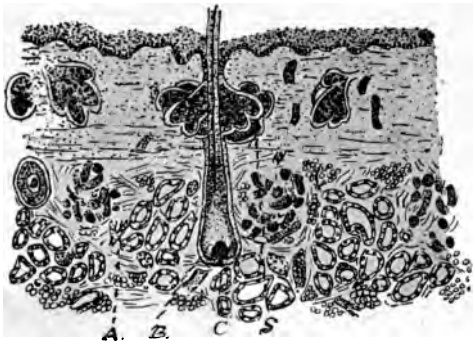

FIG. 7.—Scalp section with cellular tissue showing: Adipose Tissue. *A*, hair; bulb, *B*; papilla, *C*; sebaceous glands, *S*.

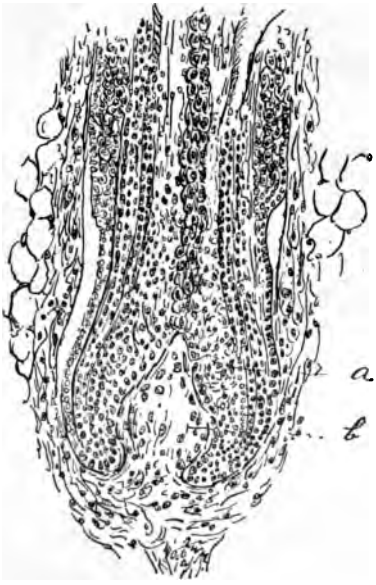

FIG. 8.—This illustration shows the papilla (*b*) in a perfect state of development; the hair bulb (*a*) surrounding it on all sides.

the excretion or the secretion of the sebaceous or sudoriferous glands.

The Papilla. The papilla or matrix is the most interesting part of the hair complex, being the hair mother, as it were.

Having the shape of a nipple or button, it is placed

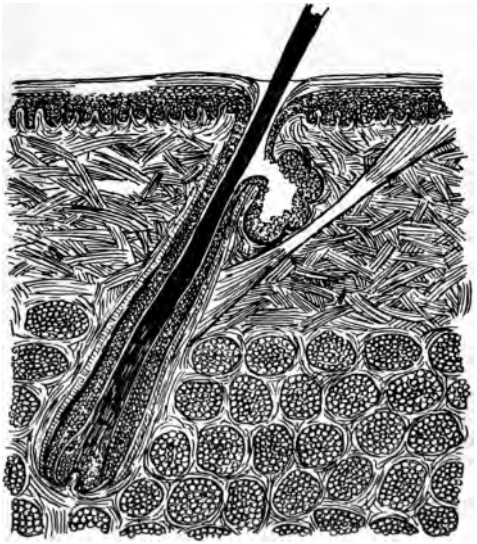

FIG. 9.—A schematic illustration of the relation of sweat or sudatory glands and the sebaceous gland. The erector pili muscle separating them.

at the bottom of the root hole or follicle, and there its function is constantly to give birth to and develop young hairs, creating cells for the different layers of the hair, for the pith or marrow, as well as for the indestructible outer horny layer and covering of the hair. But the papilla does its share not only in creating new hair, but also in the destruction and getting rid of the hair that has lived its life. By shortening

and diminishing in size, the hair which rested upon and was attached to it gets loosened and is thrown off.

The papilla by its blood and nerve supply is the connecting link not only of the general circulation, but also of the nervous system and the hair. Its relation to the nerves explains the rôle that hair plays

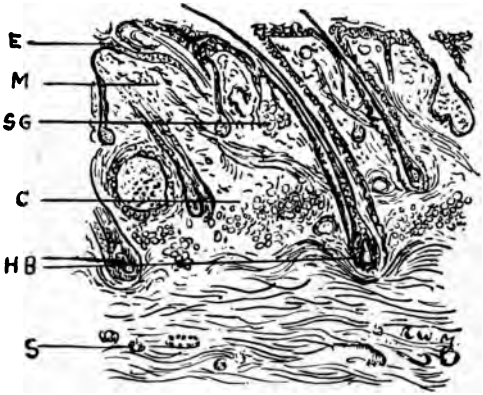

FIG. 10.—Scalp section with five hairs, all of different age and length. Note also the oblique direction the hairs are growing in. *E*, epidermis; *M*, malpighian layer; *SG*, sebaceous gland; *C*, cellular tissue; *HB*, hair bulb; *S*, sudatory or sweat glands.

as an organ of protection and defense in man and also the development of the hair at the same period as the mammary gland and general organs, changing of the skin (chloasma) and its dependent parts, the loss of hair during pregnancy, and baldness in old age.

Hence also the reaction upon the hair of all nervous troubles and maladies, of "goose skin" and cold sweats in fright, hair on end in horror, loss of hair and blanching following quickly upon mental emotion or terrible wounds.

Sebaceous and Sweat Glands. The sebaceous gland is separated from the sweat (sudoriferous) gland by the erector pili muscle or the muscle which straightens the hair and thereby compresses the sebaceous gland and releasing the oily fluid which it contains. Also by being attached to the shaft of the hair it forms, together with the gland, a compressible bag lining the wall without being connected with the hair.

In this way when the muscle contracts, the hair is bent and the gland compressed, thus facilitating the flow of sebum and perspiration. At the same time by its propinquity to the sweat gland and its relations to the vessels, this muscle stimulates the circulation of the blood and the lymph.

Grouping of Hair Follicles. Upon surfaces with few hairs, the latter are found as single isolated follicles. In the regions where there is an abundant growth of hair, the hairs are in groups of from two to four.

The hairs of each group are not usually all of one length because they are not all of one age. When one of the group falls out, the others grow faster and better.

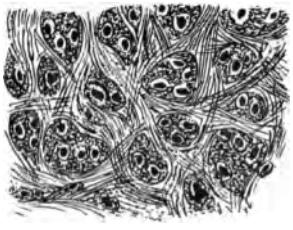

FIG. 11.—Arrangement of follicle openings on scalp. Single, double, triple and quadruple openings can be observed.

TYPES OF HAIR

Hairs may be divided into three principal varieties: Soft long hair, short stiff hair, lanugo or downy hair.

Soft Long Hair. Soft long hair is found on the head, in the beard, the pubes and the axillæ. Persons who have a vigorous growth of hair on

the head may have it so well developed on other parts of the body as to justify classing it in this group.

Short Stiff Hair. Short stiff hair occurs in the eyebrows and eyelashes, in the nostrils, and the ears. These hairs differ in their anatomy from that of the long soft hair.

The follicle is implanted almost vertically and not so obliquely as in the case of the long hairs. The papillæ are shorter, and in proportion thicker. The sebaceous glands are larger and more developed, particularly in the hairs of the nasal orifice and auditory canal.

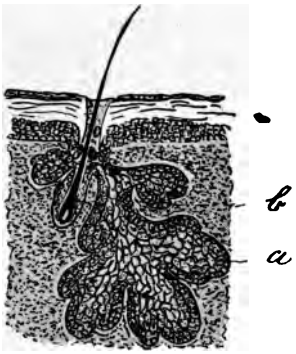

FIG. 12.—Lanugo hair showing very large sebaceous gland. Note also the absence of the marrow canal. The gland opens directly upon the scalp; *a* sebaceous gland; *b* hair bulb.

Lanugo Hair, or Down. Lanugo hair is soft and downy, and generally colorless. The surface of the body is covered with lanugo hair, except on those parts where there is long hair or none at all. When lanugo hair becomes longer and coarser, its anatomical structure is found to be identical with that of soft long hair.

HAIR CENTERS, OR WHORLS

The hairs are placed at an angle to the skin and grow from a number of well-defined centers. They have been fully described by Wilson as follows: "The hairs of the head radiate from the crown with a gentle sweep, behind towards the left and in front

toward the right. The center of the forehead is a median vertical line from which the hair passes to the right and left, the lower border of the growth forming the upper half of the eyebrows. At the inner angle of each eye is another center from which the hair radiates, the upper and inner rays ascending to the line between the eyebrows, where they often meet those from the opposite side and form with them a line across the root of the nose; and the upper and outer rays curve along the brow and from the lower half of the eyebrow."

ANATOMICAL ANOMALIES OF THE HAIR FOLLICLE

In a perfectly normal scalp there will often occur a certain number of hair follicles which differ more or less from the normal type, without, however, exhibiting such pronounced or uncommon characteristics as to warrant their being regarded as pathological. The departures from the typical follicle are:

1. Two or, much more rarely, three follicles may send their hairs through a single common follicle mouth to the surface of the skin. In this case the hairs are usually perfectly normal in structure, as are also the sebaceous glands, though the latter may be grouped so as to surround the follicle completely.

2. Still rarer is the combination of two such follicles as described above, but more complete and involving the use of a common, complete, follicular structure for a portion of, or through the entire length of, the follicle from the level of the orifices of the sebaceous glands down to the level of the bulb.

Twin Hairs. Two hairs in one common follicle are called twin hairs.

Bayonet Hairs. The anomaly here consists of a spindle-shaped thickening of the hair shaft within a short distance of the point. It is common in the whorl

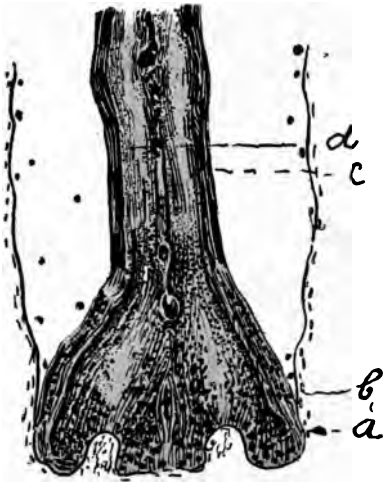

FIG. 13.—Twin hairs. *a*, papilla; *b*, hair bulb; *c*, one hair; *d*, the twin.

of the scalp in persons beginning to get bald. This variety of hair was first described and named by Prof. Felix Pincus, Berlin.

Club Hair, Bed-Hair or Beethaar (German). The hair in this position is called a club hair or bed-hair. The bed-hair is always secondary to a papillary hair, and all hairs go through this stage before they fall. They are distinguished from papillary hairs by the absence of root sheath, want of cuticle and medulla in their roots, and by having their pigment distributed in stripes and heaps.

Shedding of Hair. At certain seasons animals "shed their coat," that is, the hair falls out rapidly, and the

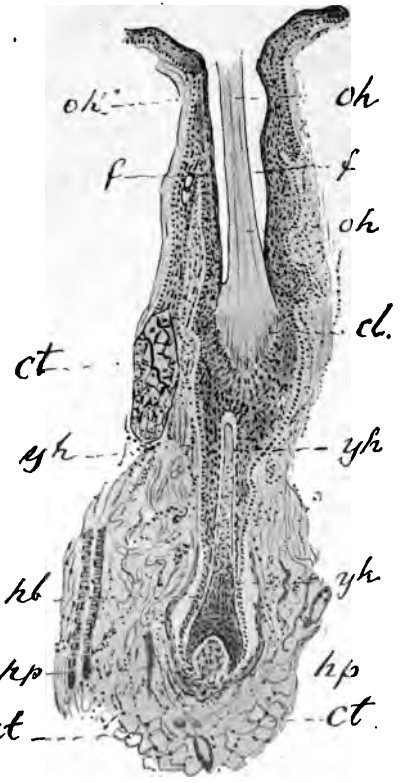

FIG. 14.—Club or bed-hair in the upper part of the follicle, young hair below it. *oh*, old hair; *yh*, young hair; *f*, follicle; *cl*, club or bed-hair; *ct*, cellular tissue; *hp*, hair papilla of young hair; *hb*, hair bulb of young hair.

coat is thinned. At the same time the old hair falls out there is a new growth of young hair and soon the coat is as thick as before.

With human beings there is a constant shedding of old hair and a constant new growth, although at certain seasons it may proceed more rapidly.

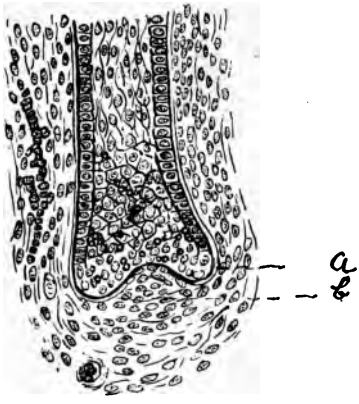

FIG. 15.—Hair near end of life. *a*, bulb broadening and losing hold upon papilla; *b*, papilla shrinking and flattening, letting go the dying hair.

The hair loosens from its papilla and mounts up to the middle follicle regions, where for a time it remains attached to the sides of the follicle and grows there. The lower part of the follicle collapses, and the papilla grows smaller. The lower end of the old hair becomes broom-like and knob-shaped.

The cause of the loosening and shedding of the hair, whether at the close of its normal life, or on account of disease, is to be sought for in the blood supply.

FIG. 16.—Hair with pigment granules.

Color. The color of the hair depends upon four factors, namely: (1) Diffused pigment; (2) granular pigment; (3) air contents; and (4) the superficial character of the hair.

The cortex plays the chief part in determining the color. The air globules are generally in the outer layers of the cortex. By the superficial character of the hair is meant whether it is rough or smooth.

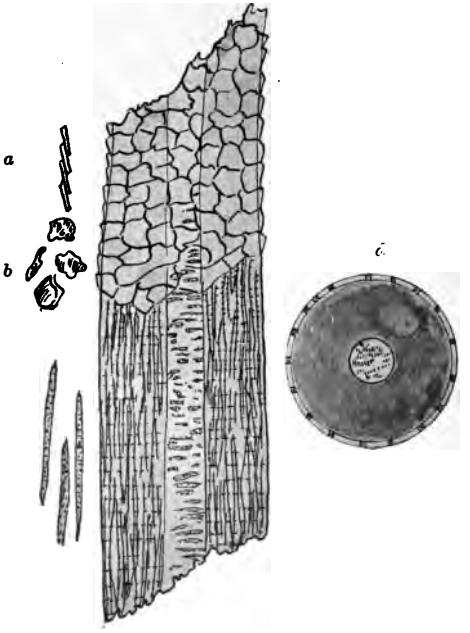

FIG. 17.—Hair shafts, showing tile-like margins, the arrangement of tiles on the upper part, *a*, series of tiles in profile; *b*, frontal appearance of the tiles; *c*, single tiles; *d*, cross section of hair shaft.

These two factors influence the color of the hair through a law of optics.

The Cortex, rind or outer covering of the hair is formed by rows of cells resembling tiles. They are laid one upon the other in such a manner that four-fifths of each tile is covered by the next one, its neigh-

bor, as it were. In this way each and every part of the hair is covered five-fold. The free ends of these tiles point toward the upper end of the hair shaft and if you grasp a fallen hair between thumb and index finger and move the hair ever so slightly by the fingers in opposite directions the hair will move

FIG. 18.—A piece of a torn hair shaft, showing tile-like margins.

FIG. 19.—Tile-like margins, front view.

FIG. 20.—Tile-like margins, side view.

FIG. 21.—Tile-like margins, side view.

quickly until its end is left between your fingers. This enables us to find either the root end or the point of a hair when you have occasion to examine them. The accompanying cuts show clearly this peculiar structure of the cortex or outer covering of the hair.

Pigment or Coloring Matter. The pigment is produced in the corium, in parts immediately surrounding the blood vessels.

In hairs of light color the cells of the cortex are devoid of pigment. The cortical cells of dark hair contain grains of yellow to brownish-black pigment.

The branches of the pigment cells form a network further up in the hair matrix, and the cortical cells of the third or fourth row are in close connection with this network, and themselves contain pigment.

LENGTH OF LIFE AND GROWTH OF HAIR

To understand fully the length of the life of the hair which varies with the age, sex and character of hair, also individual peculiarity, I give here a brief résumé of the development and growth of hair.

FIG. 22.—Another view of hair follicle, development. *a*, horny layer of epidermis; *b*, mucous layer of epidermic; *c*, papilla.

The hair develops by a thickening of the epidermis, as shown in Fig. 22. As time goes on the thickening becomes a nodule, descending a little deeper below the surface, as Fig. 24 clearly demonstrates. Here we can already recognize that beneath **a** the surface, **b**, the follicle is forming, while **d** and **c** respectively promise to turn into hair bulb and papilla.

Fig. 23 allows us to recognize both the follicle (F) and the hair bulb (B).

At a glance we see the hollowed shape of the follicle in Fig. 26 ready to accommodate the hair papilla, which in Fig. 27 is fully formed and producing a young hair, which, however, has not as yet penetrated the skin to see daylight. **A**, being the surface of the skin, still far away from the point of the young

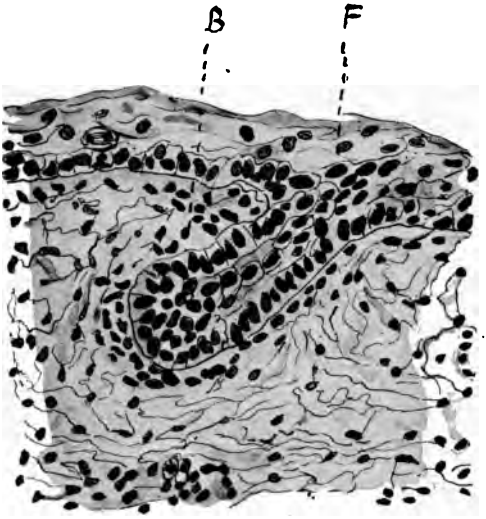

FIG. 23.—Another view; follicle more developed. *B*, hair bulb; *F*, hair follicle.

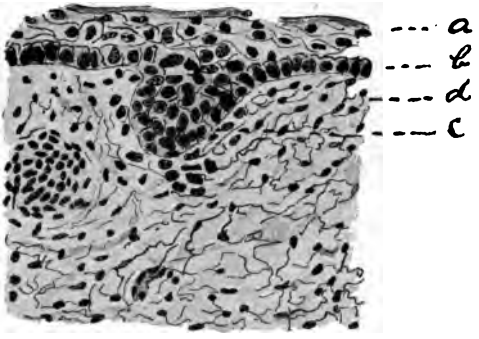

FIG. 24.—Hair papilla development. *a*, horny layer; *b*, mucous layer; *c*, papilla; *d*, follicle.

hair; **b,** the mucous layer, **c,** the situation of the sebaceous gland not yet showing, **d,** the follicle, **e,** the hair shaft, **f,** the hair bulbs, **g,** the papilla. At last Fig. 28 shows the young and vigorous hair with its appendages in their initial stage.

After the hair has reached the surface it is growing and developing and living its life.

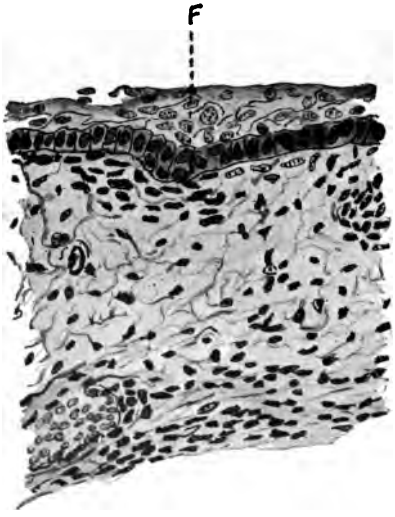

FIG. 25.—Another view, first noticeable sign of follicle forming (greatly magnified). *F,* follicle forming.

Each hair has its own determined length of life, and this is not the same for every hair of the same sort. The circumstances that determine the length of its existence are not known. The life time of the eyelashes is said to be one hundred and thirty days. The life of an individual hair on the human head is thought to be from one to six years.

Hair is said to grow faster by day than by night,

in warm weather rather than in cold. Shaving and cutting the hair may stimulate its growth, but it certainly makes it coarser.

The hair of a young woman grows at the rate of about ¾ of an inch a month. When it has reached the length of about 10 to 14 inches its rate of growth

FIG. 26.—Hair follicle on papilla development in human embryo.

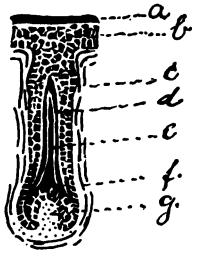

FIG. 27.—Hair, young in follicle. *a*, horny layer; *b*, mucous layer; *c*, sebaceous gland; *d*, hair follicle; *e*, hair shaft; *f*, hair bulb; *g*, hair papilla.

FIG. 28.—Hair full grown and appendages.

is reduced one-half, and towards the end of its normal life its growth is scarcely perceptible. The short, stiff hairs of the eye-brows, are from ¼ to 1 inch in length.

Number. The average number of hairs to the square inch is said to be 1,000 on the scalp. Wilson has calculated that there are 120,000 upon the head of an adult. As a rule the finer the hairs, the thicker they stand on the head, the number ranging, according to the character of the hair, from 80,000 to 150,000.

Physical Peculiarities. The curliness of the hair is influenced by the moisture in the atmosphere. This

is because the hair is hygroscopic, which means that it absorbs moisture readily from the atmosphere, becoming lengthened as well as more rounded.

Hair is elastic and capable of being stretched from one-fifth to one-third its normal length.

A healthy adult hair is strong enough to sustain a weight of from two to four ounces without breaking.

MALFORMATION OF THE HAIR

Arrest and Anomalies of Hair Development. The arrest of development comprises downy hair, curved hair, atrophied hair, canities and trichoptilosis.

Lanugo or Down. This is hair having the same ordinary structure as the normal hair, but reduced in all its parts and dimensions, above all in its pigmentation. It is found in cases of congenital or acquired baldness, temporary or permanent baldness; it is a dwarf hair, whose existence is explained by a faulty nutrition or a change in the papilla.

Curved or Crooked Hair. A hair curved or rolled upon itself, small, narrow, weak, but otherwise anatomically normal, with atrophied bulb or no bulb at all, is found in ichtyosis, with swelling and knots in keratosis pilaris.

Canities, White Hair. Normally hair has pigment granules in plenty in its cortical part and the medullary. Here, according to Metchnikoff the pigment disappears or is found here and there enclosed in migratory leucocytes, called pigmentophages, which carry away the pigment into the bulb or out of it.

Trichoptilosis. The hair is bifurcated of normal character. This condition is generally found upon

the extremity of the hair and is probably due to bad treatment.

Split Hair and Knotted Hair. These malformations of the hair have as yet no precise signification. They are trichorrhexis nodosa and trichoptilosis. The former is characterized microscopically by swellings here and there in the form of a brush, caused by the

FIG. 29.—Hair showing pigment granules in papilla, bulb and marrow canal.

bursting of the hair; trichoptilosis, also called trichonodosis and aplasia moniliformis, is very much like the former, swellings are seen here and there and also constrictions. The swollen part has a normal structure, the attenuated portion has no marrow and, in contrast with the others, has no pigment.

Alimentary Troubles. Atrophied hair is found in most scalp diseases. Microscopically such hair is found to be thin, short, pointed, little or not at all

colored, dry, fragile, down-like, curled and coming out easily. Microscopically the cortical portion is irregular, puffed out, strangled, without pigment or having too much, the marrow canal is frequently broken, dis-

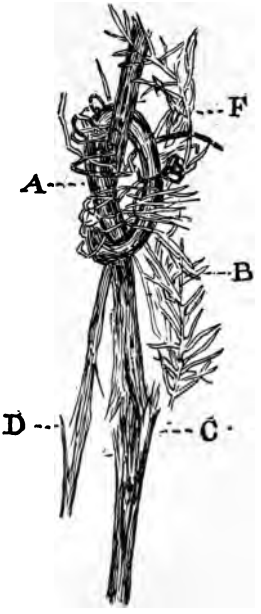

FIG. 30.—Split hair and knotted hair. *A*, knot into which hair is twisted; *B*, cotton fiber; *C*, split in hair; *D*, split in hair; *F*, a feather caught in the twisted hair.

continued, or missing altogether, in the vacant places air bubbles are found, which also find their way into the cortical substance; near the root the hair is thread-like and ends in a point, preceded or not by swelling, the bulb is pointlike or voluminous, dry, oily or surrounded by a jelly-like sheath.

Another form of hair trouble through malnutrition

are the hairs which Sabouraud describes as an exclamation mark. They have, according to him, a pathological value, coming from atrophy of the root which is dusty, threadlike, shaped like a crooked needle,

FIG. 31.—Hair with two knots.

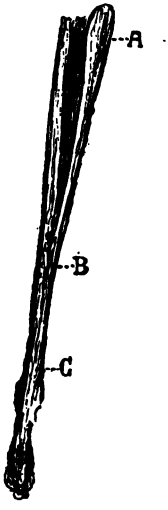

FIG. 32.—Hair knotted —exclamation point hair. *A*, upper end split apart; *B*, beginning of split; *C*, small knot.

FIG. 33.—Knotted hair.

without pigment, and spreading out of the shaft like a broom.

Seen through the microscope the upper portion of the shaft has deviated cortical cells, the medullary canal is normally pigmented in the middle lower portion, the marrow disappears, the air bubbles take the place of the pigment. On the surface of the root the hair is threadlike and diaphanous. This shrinking is often followed by swellings, uneven and irregular.

The bulb is small, round, shrunken, colorless and rough looking.

I end this section on irregularities of the hair by adding a few illustrations of differently pointed hairs

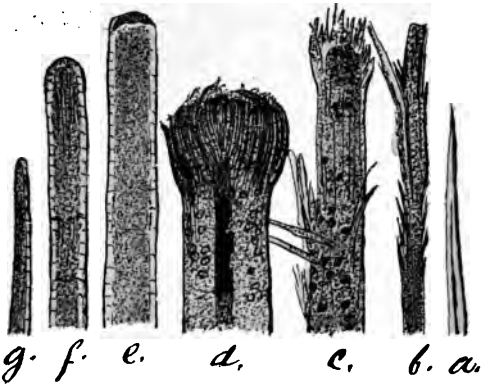

FIG. 34.—Differently pointed hairs. *a*, sharp needle-like point; *b*, splits near point; *c*, dull point with splits; *d*, brush-like point; *e*, flat dull point; *f*, same; *g*, normal point.

as revealed by the microscope showing sharp needle-pointed, split, dull, brushlike, flat dull pointed and normal hair points.

CHAPTER II

LOSS OF HAIR

The Normal Loss of Hair. To understand fully the process taking place on the human scalp when abnormal loss of hair begins, we will consider for a moment the condition which precedes baldness. The process of the normal falling out of hair is as follows:

The same papilla always remains for each succeeding hair, new papillæ never form. The new hair pushes forwards and upwards within the follicle and opens up the follicle, which has until now remained hermetically sealed, detaching the old hair from its hold. It now can be removed by any mechanical force, comb or brush. **Every time a hair drops out of its follicle, it signifies the growth of a new one.**

The normal loss of hair is little noticed in the young. At the age of eighteen it makes more impression upon the person. The amount of falling hair increases, the return growth shows a slight difference in size, not being quite so thick. Microscopical examination of the scalp usually shows that noxious germs are deposited there in large numbers, and especially white blood corpuscles, lymph and pus corpuscles, (lymphocytes).

This leads us on to the consideration of abnormal loss of hair which arises either from local causes or from an anomalous condition of the body.

THE VARIOUS CAUSES OF FALLING OUT OF THE HAIR

The famous dermatologist Stein classifies these causes as they affect the hair itself or the hair-producing apparatus. The first group includes the infec-

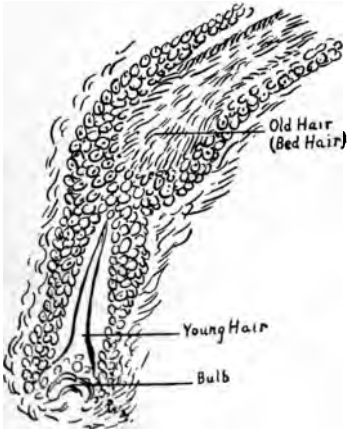

FIG. 35.—Hair, old and ready to drop out; a young hair below pushing it upward. The old hair has the broomlike bulb and is attached to the sides of the follicle having a bed there, hence the name bed-hair.

FIG. 36.—Young hair, pushing to daylight. *B*, bulb of hair; *Pa*, papilla; *Pt*, hair point.

tions, and the second the alopecia of neurogenous, toxic or cicatricial origin, and that from atrophy. There can be no doubt that purely nervous causes may induce the hair to drop out, or that reflex vasomotor disturbance from a fright may injure the papilla enough to kill the hair. Stein cites examples of each.

Alopecia of toxic origin is general, the patches in syphilis are probably due to nests of spirochetæ.

Thallium given to arrest night sweats in tuberculosis is followed by a general dropping out of the hair for from one to three months. Then it grows in again. The fallen hairs are normal, showing that the alopecia is the result of toxic injury of the trophic center.

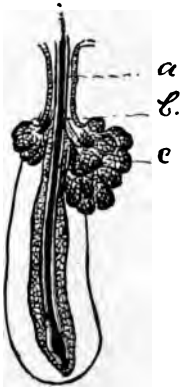

FIG. 37.—Young hair with its sebaceous gland on either side. *a*, hair shaft; *b*, hair follicle; *c*, sebaceous gland.

FIG. 38.—Young hair near epidermis. *H*, hair; *B*, bulb; *P*, papilla.

Baldness, Stein relates, is connected with the secretion of the sebaceous glands. The secretion of sebum is most profuse in the scalp, face and over the shoulder blades. Brow and nose are normally covered with a coating of oily sebum, possibly because these regions have no subcutaneous layer of fat and hence this ex-

tra secretion protects against excessive radiation of heat. The sebaceous glands may thus have an action antagonistic to that of the sweat glands. When the skin is chilled and "gooseflesh" forms, this squeezes out the sebum and a protecting oily coat thus covers the region and prevents radiation of heat—"Muscular exertion produces sweat, mental exertion produces sebum."

The development and functional activity of the se-

FIG. 39.—Cross cut of full grown hair.

baceous glands are intimately connected with those of the genital glands. Regular functioning of the latter causes increased secretion of sebum; this clears out the stagnating sebum and may thus cure a tendency to acne. A sudden profuse secretion of sebum may push out hairs only loosely held, and thus induce a transient falling of the hair.

Stein explains further that the hair and the sebaceous gland form a unit like the leaf and flower on one stalk. If the leaf develops out of proportion, the flower suffers, and excessive functioning of the se-

baceous gland is at the expense of the hair. The gland gets all the nourishment and the hair wastes away from lack of nourishment. The papilla produces weaker, poorer hairs and finally stops producing them altogether. This occurs at the points where the secretion of sebum is most pronounced and the blood supply most precarious.

As the connection between the activity of the genital glands and the secretion of sebum seems to be an established fact, it suggests the explanation for the restriction of baldness, to the male. There is a phy-

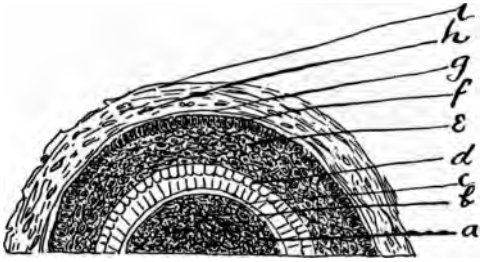

FIG. 40.—Hair, semi-circular cross cut. *a*, hair; *b*, upper layer of skin; *c*, inner layer of skin; *d*, exterior layer of follicle; *e*, mucous layer; *f*, epithelial layer; *g*, vitreous (glassy) layer; *h*, fibrous layer; *i*, boundary or external covering.

siologic limit to the functioning of the genital glands in women but not in men. The assumed hormone from the genital glands which apparently stimulates the sebaceous glands to keep up their work, is continuously produced in men while in women there is no further opportunity after the menopause for this hormone to be produced, and hence the sebaceous glands in the scalp lack this constant stimulus to functioning. A woman's scalp is also shielded by the long hair, so there is less sebum needed to pro-

tect it against chilling. To sustain this theory of the mechanism of baldness, he cites among other data

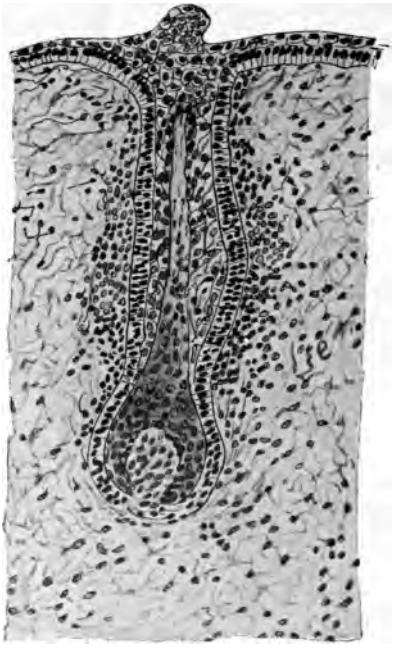

FIG. 41.—Hair, young, nearing epidermis.

the observation that men of the eunuchoid type do not grow bald.

THE EARLY SYMPTOMS OF ABNORMAL LOSS OF HAIR AND BALDNESS

Local disorders of the scalp are always of inflammatory nature. The visible or objective signs are scales and loss of hair. The scales may differ in their appearance, according to the degree of oiliness.

The normal desquamation or peeling off goes on continually in minute scales, because the space between the closely growing hair does not permit of large sized scales. The normal scalp is white and clean.

The oily deposit is considerable, but daily brushing and combing and occasional washing remove any excess of scales. It is better for a scalp to be too oily than too dry. Good hair may grow for many years in an oily scalp, on which an easily removable layer of grayish, soft, greasy scales are deposited. But a continuous excess of oily secretion, meaning an **enlargement of the sebaceous glands,** will sooner or later produce an abnormally thin, slower-growing hair, which is recognized as the **first stage of alopecia pityroides,** or bran-like baldness.

Treatment. Appearing earlier and more frequent among males than females, this condition can often be remedied if treated properly and early enough.

Frequent washing with alkaline soap of considerable strength, will remove the greasy deposit and excessive sebum.

If no oil or pomade is applied to the scalp, new secretion is produced by the glands, to replace that which is removed by the washing.

The washing becomes necessary in ever shorter intervals.

If now the washings are omitted and strong alcoholic solutions are used daily for some months, favorable results may be expected.

By these simple hygienic means an improvement in the condition will be noticed in time. Men usually require to use more oily applications, than do women.

A suitable mixture for applying to the scalp day after day between the washing is as follows:

℞

Acidi salicylici 5.0
Olei ricini 3.0
Spir. vini rectif. ad.....200.0

M. S. Use on scalp after washing. Do not expose to open flame!

Seborrhœa Oleosa. Totally different is the condition of things when we deal with an excessive secretion of sebum, which no remedy can control. This condition is called Seborrhœa Oleosa, a rare disease and hard to cure.

Inunction, shampooing, fat-dissolving benzoated petrolized solutions, internal medication (arsenic, atropin) as well as x-ray applications are often used with no results.

Often the greasy layer upon the scalp has a brownish tint and resembles the Eczema seborrhoicum; hairs are easily removed from such a scalp and grow rapidly, thinner and shorter.

Dry Seborrhœa is much more frequently met with; thin, dust-like scales are found in abundance, mostly on back of head and temples. These scales are the accompaniment of inflammatory processes which are taking place in the scalp.

There is an intolerable itching which however is not sufficient to cause scratching and soreness.

The dry scales are diffuse, or irregularly spread over the head but especially great on the above mentioned places. Particularly in some cases there may be a series of spots in areas which may develop a resemblance to Psoriasis.

CHAPTER III

BALDNESS (ALOPECIA)

Baldness begins usually at the temples, more rarely on the crown of the head, where it commences in a circumscribed or outlined circle, almost like a tonsure but usually more extended and covered only with short and kinky hair. In the course of time this sparsely covered spot grows larger, but there is always a certain amount of very fine lanugo hair to be found on it.

FIG. 42.—Seborrhœa, loss of hair. Crown baldness, commencing at the front.

The follicles from which the hair is gone are occupied by enlarged fat glands, which by their increased secretion cause a continually oily surface.

The skin on the bald places is at first, and probably also during the later stages, not at all atrophic or wasted, but the hair thins out, not, however, disappearing completely.

Only in rare cases does the alopecia at the back of the head become visible, nor does it begin early. The remaining hair is less dense than normal and has generally become white for the most part, when baldness is complete, for when baldness is completely developed the age of fifty has generally been reached. The scalp becomes glossy, white and tense, like a billiard ball.

Crown baldness (at the top) extends in the form of a star, usually towards the forehead, with branches so that the bald area is bordered all round by a more or less distinct fringe of hair. At the same time the hair border at the forehead moves farther up and

FIG. 43.—Seborrhœa baldness, having reached its full extent.

backwards and meets the hair corners still left at the back of the head.

Therefore, there may remain three hair zones—a center one and the two on the temples which connect with the hair on the back of the head forming a horse shoe, which never entirely disappears, even when the baldness has reached its full extent. The center zone bordered by the bald zone of the forehead and by that of the crown of the head is gradually lost entirely.

Thus complete baldness reaches its full development.

The time for the development of acute baldness, which is generally spoken of as premature baldness in contradistinction with the senile depletion, which sets in with intensity toward the age of fifty, spreading gradually and evenly over the entire scalp, differs widely. Sometimes it is fully developed at the age of thirty, sometimes at a more advanced age. Also the bare zones—the front, the center and at the back—develop at a different rate of speed. More often the one in the center develops quickest, but the high bald forehead, resulting from the quicker denudation of the frontal parts, is also often seen. Sometimes, on the places which in youth were the hair border on the forehead, there remains a circle of well pigmented longish hair, and behind this begins the real partly developed baldness. This form of baldness is more frequently met with among women than among men, and is never so fully developed.

The three kinds of baldness are:

(1) **Premature Hair Loss.** Commencing at the age of thirty, it is frequently hereditary, beginning at the same age in ancestors and descendants. With some it develops and progresses rapidly, hair falling out simultaneously upon the frontal portion of the scalp, the temple and the summit of the crown, leaving for a while a tuft of hair over the forehead and a band from ear to ear. It is differentiated from senile baldness by the following points:

(a) The full-grown hairs fall out first and are replaced by weak, slowly growing ones, later by down, which also disappears, leaving a bald surface.

(b) By the coincident or previous appearance of

FIG. 44.—Loss of hair which may improve.

local sweats, itching, excessive oily secretion of the sebaceous gland, bran-like scales in excess.

(2) **Senile Baldness.** Progressive loss of hair com-

FIG. 45.—Loss of hair due to seborrhœa.

mencing around the fortieth year, often later, preceded or not by the symptoms indicative of coming

baldness. It is a physiological phenomenon resulting from the normal evolution of the scalp, which leads to atrophy of the papilla, the bulb and loss of hair.

It starts at the vertex in the form of a tonsure; from there it increases progressively in a circle around the remainder of the head. At the same time as the vertex, the temples are being stripped. A few hairs may persevere for a long time in the center of the front part of the scalp.

The top of the head presents a smooth, brilliant ivory-like surface. This is senile baldness pure and simple, which is generally not accompanied by other affections.

(3) **Symptomatic Baldness.** i.e. Baldness due to local or general causes. The local causes comprise besides bad hygiene, accidental injuries (traumatism), baldness caused by friction or compression, accident, skin affection; those due to general disease or to troubles located in the cranial cavity and to all causes which most often affect the hair follicles.

General causes are acute maladies or chronic infection and toxic diseases. It is not accurately known how these affect the hair, whether they act through themselves and their poison or toxin, or whether they prepare a soil, on which microbes and parasites, microbacilli, streptococci flourish.

(a) **Baldness due to Lack of care.** Lack of hygiene of the scalp, neglect of or too frequent shampoos, accumulation of dust from street and work shop, frequent rubbing with alcohol, ether or bayrum, vaseline and pomades containing irritants end in loss of hair.

In a similar manner the constant wearing of stiff hats and having the scalp always covered, masses of false hair, both depriving the scalp of proper ventila-

tion; pulling the hair in a direction opposite to the one in which it grows from the follicle; impractical, badly chosen combs and brushes; the useless employment of peroxide of hydrogen, henna and other coloring matter end in great destruction of hair.

Extreme dryness as well as excessive transpiration,

FIG. 46.—Alopecia totalis or decalvans.

accumulation of decayed skin upon the scalp, or adhesive oily secretion, whose removal has been neglected, provoke the loss of hair, particularly with people predisposed to baldness by heredity.

(b) **Traumatic Baldness or Baldness Due to Injuries.** A nervous affection named trichotillomania, an insane impulse to pull out hair, causing great itching all over the hairy parts of the body, inducing those who suffer from the affection to pull out masses of hair wherever this lively sensation of itching is felt.

The hair upon examination proves healthy and grows again in a normal manner afterwards.

(c) **Baldness Caused by Friction.** Upon the rear lower portion of the head, not so often on the sides above and behind the ears we find quite frequently the scalp denuded of hair. This is caused by long continuous bedrest (decubitus) of children and bedridden patients. Their heads resting upon the pillow in the same position for a long time causes the hair to fall out and stunts its growth. Similarly convalescents show bare spots caused by pressure of the head upon pillows.

Under this head we class also that form of hair loss occasioned by certain styles of hairdressing and use of pins which exert pressure enough to bare the sides and temples. The hairs left are normally colored, but frail, irregular and broken.

(d) **Baldness Due to Scratching.** This is an irregular form and coincident with the pruriginous affection mentioned above.

(e) **Baldness Due to Accident,** such as a wound made by a blunt instrument. This can be recognized by its oval shape and may be compared with a patch of alopecia areata (baldness in patches) in certain cases.

The hairs fall out suddenly and return quickly. No change is noticed, the bulb is healthy. When such a form of hair loss is seen soon after the receipt of the injury, extravasation of blood (echymosis) of the scalp will testify to its origin, also the bare spot not being round as it is in fungoid diseases of the hair, renders the diagnosis more certain.

When seen later new hair will be found and on

examination the absence of hairs [illegible] an exclamation point will make the diagnosis [illegible]

(f) **Baldness from Burns.** This may either be from boiling water or from inflamed ether or alcohol, or from sulphuric acid in a criminal attack. It is intentional only when physicians use cautery irons (thermocautery) or blistering agents (vesicatories). There will be a scar in every case.

FIG. 47.—Cicatricial baldness.

FIG. 48.—Another view of baldness caused by a cicatrix.

Roentgen rays cause baldness generally at the temples and side of the head around the ears. It often destroys hair tube and hair papilla.

(g) **Baldness from Scars or Cicatricial Baldness.** This variety is similar to the circular baldness, only the presence of a line or patch of depression, sometimes red or pink entirely smooth or very white with reddish border, distinguishes it from the other.

When the cicatrix is not in a bald area, it is shaped like a tape or stripe and the hair is flattened down, depressed and adherent to the bone. The surface is

uneven, honeycombed, less polished and shining than in baldness. The surrounding hairs are thick, solid and long.

(h) **Baldness Caused by Epilation** (removal of hair by electrolysis). This is done by physicians for medical purposes. This form is easily recognized, as the bald area is limited and occupies only the part of the scalp affected by the disease.

(i) **Baldness Caused by Skin Affections and Inflammation.** Most skin diseases cause baldness which is rather diffuse. When the skin affection is ill-nourished (dystrophic) congenital in character, like ichthyosis, scaling and hair loss take place at the same time.

All the eruptive fevers cause the hair to come out. Local skin troubles, erysipelas, herpetiform or exfoliative, eczema, psoriasis, lichen ruber planus, all bulbous eruptions and scleroderma cause temporary as well as permanent loss of hair.

(j) **Baldness Due to General Diseases.** There are three characteristics by which we recognize baldness to be due to general diseases.

(1) Their development is abrupt and progressive during the course of an accompanying disease (not cutaneous).

(2) They spontaneously proceed towards recovery.

(3) There are temporary changes in the hair as well as in the finger nails, which are called atrophic, meaning due to wasting disease. The Beau lines are horizontal grooves in the finger nails and are named after Dr. Beau, who first described them.

(k) **Baldness Due to Acute Diseases.** Following acute diseases abnormal hair loss is a common occurrence. This may be more or less intense. The hair

comes out by bundles, tufts and locks over the entire scalp; it does not break, is neither atrophied nor deformed, only sometimes split at the ends (trichoptilosis). The bulb is normal in size, the hair smooth and shiny, more often dry scales are noticed (pityriasis), seldom oily ones or crusts.

When the nails are examined transverse lines are discovered upon thumb and index finger (Beau's lines). The most serious defluvium (rapid shedding of hair) is caused by an attack of erysipelas extending over the scalp. The hair stops growing immediately and falls out in masses, much sooner than in other acute infections, because of the high fever which interferes with the further growth of hair, the irritation of the local disease is added. This irritation may be so violent as absolutely to hinder new growth of hair and permanent baldness results.

FIG. 49.—Baldness caused by nephritis. Intense loss of hair affecting the whole scalp. These cases recover their hair after reconvalescence.

(1) **The Baldness of Chronic Diseases.** Visceral (utero-ovarian, gastro-intestinal hepatic), nervous diseases and disorders of digestion are followed by more or less extensive hair loss according to the severity and duration of the illness.

This form of alopecia is temporary and characterized by a slow, progressive, persistent and diffuse loss of hair with swaying changes (oscillations) intermis-

sions and periods of rest. The hair is smooth, clean or with dry or oily scales or crusts.

Examination of the finger nails show the Beau line (horizontal lines) we see in the baldness following acute diseases, only they are more diffuse and are found upon the base as well as upon the head of the nails.

Hair Loss Following Intoxication of the Body. This may be observed after the use of certain medicaments by persons with a predisposition. Certain physicians claim that the taking of mercury and iodide is followed by considerable hair loss.

FIG. 50.—Syphilitic baldness (gumma).

This theory is far from being proved, as in syphilitic alopecia the hair fall does not only stop after the use of those drugs, but the hair is known to grow well, when full mercurial treatment is given.

Loss of Hair After the Use of Acetate of Thallium. This form of alopecia occurs soon after the absorption of even weak doses of a drug called acetate of thallium. At the end of 2 to 8 days after its use the hair begins to fall out suddenly, not only from the scalp but from all over the body. On the temples it shows in large white patches. In a month's time the hair has disappeared all over the body: some bulbs dry up, other hairs break off within the follicle. The scalp surface is normal but entirely bare.

Alopecia Areata. The characteristic mark of this form of baldness consists in the appearance of bald spots, area, patches, confluent or isolated, extensive or less so, but different in form and appearance.

These bald areas appear insidiously without concomitant symptoms. The hair fall is rapid, hair coming out by tufts in a few days. It may spread slowly, eccentrically, or only upon one part of the periphery.

FIG. 51.—Mild case of alopecia areata, showing only the small placques.

FIG. 52.—Alopecia areata, large areas of baldness in young man.

The hair which drops out has a complete bulb; many have the root dried up and shriveled broken hair is found upon the periphery of the patch and at some distance from the same, when the baldness spreads. These hairs have a peculiar appearance, being 2-6 millimeters long, their end frayed like a brush, dark of color half way from the point down, thinning out towards the lower portion, ending there in a swelling which gives them the appearance and the name of an exclamation point. As they are implanted close to

the surface they come out very easily when pulled, without even breaking.

The bald spot has a pink color, is a little œdematous and marked all over with dilated orifices of the hair follicle containing seborrhœic material. After a while the skin shrinks, turns ivory white, smooth, soft to the touch and pliable.

On the way to recovery, it becomes covered with downy hair, slender and weak, easily removed; these make room for the more vigorous young normal hair and finally a thick crop of darker colored, or sometimes white hair, takes place permanently.

FIG. 53.—Alopecia areata. Still more extensive bald areas on crown of scalp.

The bald areas, variable in number, are situated most often near the vertex occiput and temples, but other regions also are attacked by the disease.

The beard may also be affected, and the eyebrows and eyelids, indeed all the hairy portions of the body have been seen to be denuded by alopecia areata.

Area Celsi. As a variety of this disease area celsi may be mentioned. It is recognized by an extensive bald area reaching from temple to temple, from occiput to frontal bone, leaving a fringe of hair like a crown. This is most frequently seen in children and is very rebellious to treatment.

Another variety appears in small patches of great number.

Alopecia Decalvans. A third and last variety to be mentioned and the gravest of all alopecias is the one called decalvans, meaning a total destruction of almost every hair upon the scalp and body, a few tufts being left here and there.

The course of alopecia areata is very variable.

FIG. 54.—Alopecia areata, almost complete alopecia areata.

Light cases get well in from 2 to 6 months. Relapses, reappearances of bald spots even before all the old ones are recovered with hair, are frequent.

The process of denuding the scalp may go on from one to four years and may get entirely well in young people and only incompletely so in old ones.

Only a short time ago it was the opinion of dermatologists that alopecia areata was contagious and due to parasites.

After Professor Joseph's (Berlin) experiment on cats it was proved, that the origin of this disease may be due to some disorder of the trophic nerves, whose

FIG. 55.—Total alopecia areata in a school boy.

function it is, to regulate nutrition of the integument.

Bad teeth, headache, eruptions of wisdom teeth, ear

FIG. 56.—Front view of Fig. 55.

trouble (otitis media) are some of the causes assigned for this affection.

Nerve shock due to severe accidents is responsible for alopecia areata. This form may heal without treatment.

Diminished secretion of the thyroid gland (hypothyreosis) is known to cause the disease.

CHAPTER IV

DISEASES CAUSING BALDNESS

SEBORRHŒA

This disease is most readily diagnosticated by the examination of scrapings from the scalp.

A great deal of confusion exists among dermatologists about this disease of the scalp. Some ascribe its origin to the work of a bacillus (bacille a bouteille of Sabouraud, Flaschenbacillus of Unna) and others

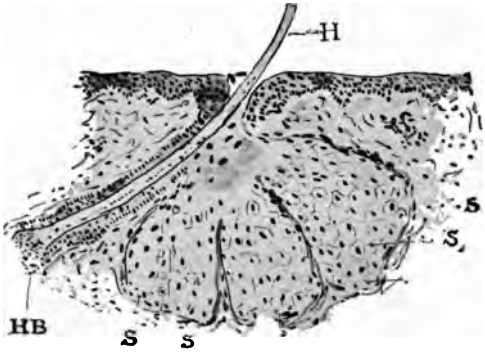

FIG. 57.—Seborrhœa of scalp. *H*, hair; *HB*, hair bulb; *SSS*, sebaceous gland.

say it is entirely due to a diseased or disordered condition of the sebaceous glands of the scalp.

In this discussion of the subject, seborrhœa includes all disorders of the scalp which cause desqua-

mation, excepting psoriasis, be they dry or oily, no matter what the histological structure, the chemical composition or the origin of the scales may be.

In seborrhœa we have a mild inflammation of the

FIG. 58.—Seborrhœic follicle, by Sabouraud. Dead hair surrounded by hardened sebum losing vitality from this interference. *H*, hair lying dead within the follicle filled by the seborrhœic plug (S.P.); *SA, SA*, are accumulations of sebum.

scalp followed by desquamation, which is nearly physiological, that is, a process going on in a normal body, as for instance in pityriasis simplex or dandruff, without presumption of microbic influence; but there are also true organized maladies of the hair lobules and of the sebaceous glands.

In oily seborrhœa, troubles of the sebaceous system are cotemporary with the development of the genital organs, the mammary and testicular glands; troubles tending to the destruction of the hair follicle with its glandular system and the loss of hair in consequence; troubles complicated with microbic infection of the sebaceous ducts of pyogenic origin.

The above-mentioned maladies in systematic order

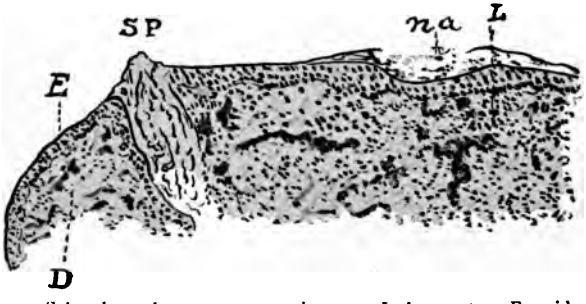

FIG. 59.—Seborrhœa oleosa. *na*, necrotic acne; *L*, leucocytes; *E*, epidermis; *D*, derma; *SP*, seborrhœic plug.

have their cycle of chronic diseases: seborrhœa, acne, baldness, total or partial, and many others resembling seborrhœa as for instance the eczema seborrhoicum, described by Unna, staphylococcus infection, atypical psoriasis and similar disorders characterized by scaling, which may be classified according to their favorite location and their relative dry or oily character.

Seborrhœa Sicca or Dry Seborrhœa. Pityriasis simplex, commonly called dandruff, and recognized by its fine branny scales, may be either local or general, spontaneous or intermittent, covering collar and shoulders of the afflicted with white dust like scales, particularly after combing and brushing the hair or after scratching caused by the intolerable itching of

the scalp provoked by the disease. It is most frequently seen by the specialist.

It is due primarily, to subacute inflammation of the scalp followed later by insufficiency of sebum, or to disturbance of glandular action. In the majority of cases it accompanies some interference with the circulation and nutrition of the scalp.

It may last a considerable time, is subject to fluctuation due to overwork or lack of proper nourishment, sickness, lack of care, exaggerated shampoos and irritating frictions. It may end in great hair loss.

Hebra describes a form of dry seborrhœa, which is closely connected with both pityriasis and seborrhœa, the seborrhoic eczema.

It is distinguished from the other form by the large size and thickness of the scales, and the fact that the underlying skin is slightly red, an erythema more or less diffuse being apparent all over the scalp.

Symptomatic Dry Seborrhœa is also found in most of the general skin diseases due to the interference with the vascular nervous system (folliculitis, acne). Baldness may follow. Whenever in the course of these affections glandular trouble supervenes, the seborrhœa changes from pityriasis simplex into the oily greasy form and may lead to complications like folliculitis, acne and baldness, like the preceding variety.

Seborrhœa Oleosa, Oily Seborrhœa. This is recognized by the more or less oily layers upon the scalp and is not often seen.

In new-born children we see, on inspection of the scalp, quite frequently a thick viscid layer, which after a few days becomes a crust, slightly adherent, easily removed with oil or vaseline. When these crusts are left upon the skin, dust, hairs and microbes will soon

be found in them, giving a dirty appearance, which is often mistaken for impetigo or infantile eczema. The condition just described is physiological and normal.

FIG. 60.—A normal hair with sebaceous gland.

Oily seborrhœa and Sabouraud's seborrhœa, excessive discharge of sebum, are seen in two aspects; one only oily, the other with crusts and desquamation. Both varieties may occur together and one may follow the other in the evolution of the malady, but both are rare.

Normally a slight amount of fat is seen upon every scalp, but whenever this secretion becomes excessive, when an abnormal amount of perspiration, loss of hair over the frontal bone and at the temples is noticed, we know for a certainty that oily seborrhœa is present and at work.

Simultaneously, we notice in adults a greasy condition of the integument of the face and particularly of the wings of the nose, where we also observe the presence of comedons.

Young people of both sexes suffer from acne in its different forms before the appearance of or at the same time with seborrhœa.

In the later stages hair loss has made great progress, the scalp, becoming more and more atrophic, shines brilliantly and at last becomes dry.

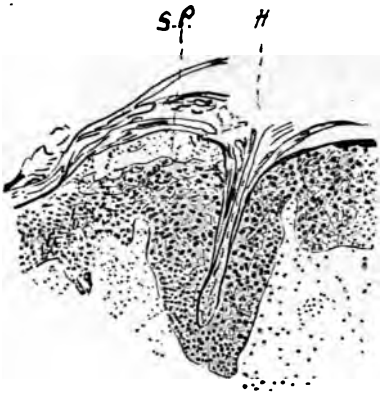

FIG. 61.—Seborrhœa of scalp. *S.P.*, seborrhœic plug.

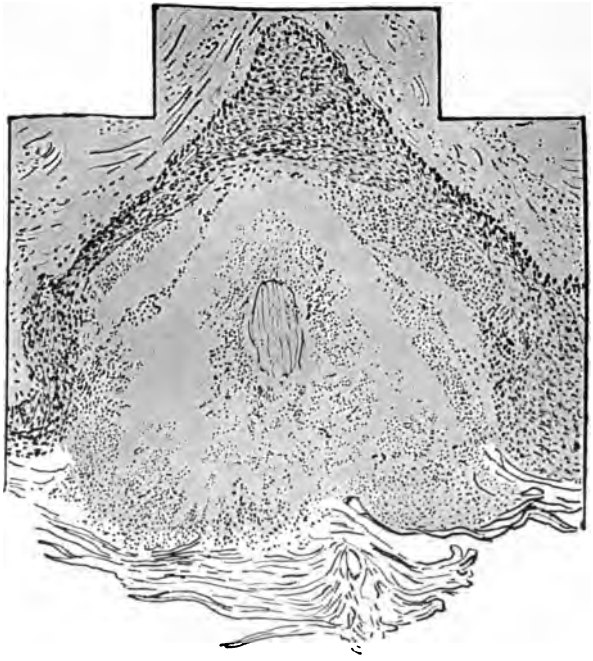

FIG. 62.—Folliculitis of scalp, often seen in oily seborrhœa.

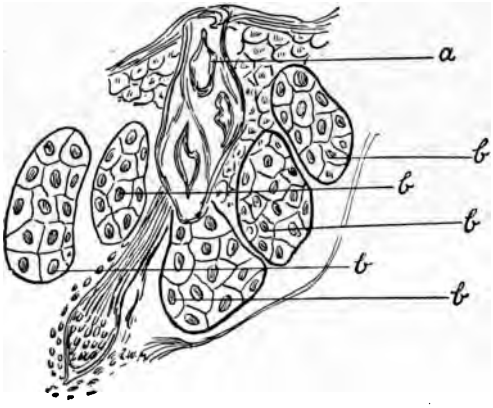

FIG. 63.—Enlarged sebaceous glands. *a*, seborrhœic plug; *b*, *b*, *b*, sebaceous gland.

Coagulated Crustous Seborrhœa. A variety of seborrhœa called coagulated crustous seborrhœa is described by Gaucher and shows some differences in

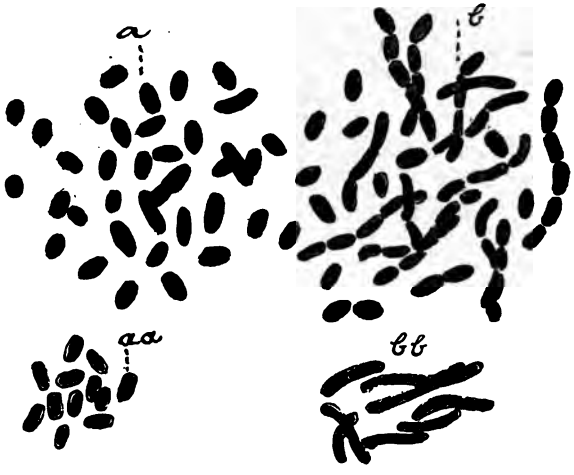

FIG. 64.—Microbacilli of seborrhœa in different stages of development.

its character. It is rarely met with and deserves no mention here.

ECZEMA SEBORRHOICUM OF UNNA

This malady manifests itself by a greasy desquamation; the scales come off in circular patches on the scalp and their location is most often on the frontal hair border and the periauricular space: they are thick, shiny and resemble psoriasis scales. Below them we find a reddened scalp, rarely oozing. The hairs traverse the scabs, do not come out, and are little changed.

On inspection of the sternum and back, eczema is often found to be present.

Unna claims that this seborrhœa is due to the invasion of the hair follicles by the morococcus, a variety of the staphylococcus.

PRURITUS IN SEBORRHŒA AND OTHER DISEASES

One of the most unpleasant symptoms of seborrhœa and many of the other scalp affections, is pruritus, hence we mention it here.

This is a nervous affection with many varieties and different degrees of severity. The most common form of pruritus is that of diabetes and often nephritis and affections of the liver have pruritus as a symptom.

Toxins generated by internal maladies, such as cancer of the stomach or other part of the gastrointestinal apparatus will cause intolerable itching of the scalp.

Pseudoleukaemia, lymphosarcoma and lympho-

granuloma are mentioned by Blaschko as causes of pruritus capitis.

Certain foods and drink, alcohol, coffee, berries, etc., are blamed for more or less intense attacks of itching.

Neurasthenia, hysteria, uterine, ovarian disease gravidity of the uterus, acute infectious diseases like typhus, meningitis, acute and chronic, and tuberculosis will in many cases cause intolerable itching and scratching, eventually causing bald areas upon the scalp.

ABSCESSES OF THE SCALP

Abscesses are seen sometimes on the new-born baby as well as on older children. Among new-born babies they are coincident with other abscesses of the body; they loosen the scalp, are more or less numerous and voluminous. These multiple sub-cutaneous abscesses are related with a cachectic diathesis or follow an infectious illness, or are connected with the development of tuberculosis more or less.

Among older children and adults, it accompanies an infection of the scalp, and denudes it to a considerable extent. It stimulates syphilitic gummata, tuberculosis, or, if they are very localized, ulcers.

Ulcerous Type. The lesions due to specific bacilli, or to their toxins, and related to tuberculosis and syphilis, often take the form of pyodermites, whether at the opening, or diffuse and bordering according to the clinical appearance traced to localized seborrhœa, pustules and necrotic acne, particularly at the edge of the forehead.

They often leave behind cicatrices more or less extensive and diffuse. If the syphilides recover and

... after the regrowth of the hair, ... of filamentides or favus.

ACNE

... most often found upon the fore- ... frequently seen on the scalp. ... scattered flat, red, firm papules. ... yellow centers which are ... brownish hue. When re- ... itself. After healing de- ... pitted scars are left. The ... and never grows again. ... at the same time upon the ...

... papular syphilides by its ... absence of characteristic ...

... recognized by the presence of ... by the rapid process of ... pustules.

... is recognized by its ... red patches, with in- ... their circumference.

ACNE KELOID, OR SYCOSIS VULGARIS

These are pustules appearing on hair border or on back of the neck and are found close to the hair follicle and around them. Slowly they increase in number and size, crowded together with uneven lobulated surfaces. It may enter the region of the scalp or reach the crown in time.

After a while the mass may soften under application of hot poultices and on cutting, ill-smelling and semi-fluid pus is found.

Gradually the swelling hardens and becomes keloid in appearance, whence the name. Hair is seldom seen on these growths. It takes years to heal this disease fully.

While some patients complain of pain others are not inconvenienced at all. The disease is seldom seen.

ACNE NECROTICA

Acne necrotica, Acne rodens or Acne varioliformis Hebræ, is an affection of long duration, tenacious, persistent, disheartening, because of its position, its continuance and the cicatrices and bald spots which it leaves behind.

It is frequent among the young and particularly with women during the menstrual period between twenty-eight and thirty years.

It is a pustular acne occupying the region of the temples and the border of the scalp, more or less confluent. Around the orifice of the follicle there exists a red protuberance, in the middle of its summit is a pustule, from which a hair issues. The focus opens like a crater, a navel closed by a yellowish green crust sunk deep which rises up leaving a scar, and indelible depression. The hairs are wasted, the follicle bruised and the papilla destroyed.

CARBUNCLE

Carbuncle is merely a complexus of closely situated furuncles caused by the same micro-organisms as the

latter, only the general and local symptoms are much more severe.

There is always high fever, depression, headache and severe pain in the parts affected. The carbuncle increases sometimes very rapidly reaching the size of the palm of the hand in a brief period.

Young people are rarely attacked, the old being preferably victims of this affection, which has for its favorite the hair border at the nape of the neck. It destroys the hair at the borders.

FOLLICULITIS

Proper Folliculitis. Alopecia Innominata. Inflammation of the hair follicle may end with the loss of the hair without producing any appreciable symptoms during the course of its development. If the little abscesses are closely united, the resulting alopecia will resemble that of alopecia areata, but in that case there will be found in the excrescence at the surface of the lesioned area generally irregular tiny depressions and scars with hairs in the center.

Folliculitis is a harmless bacterial infection representing a superficial inflammation localized upon the epidermis, caused by the invasion of staphylococci and more seldom streptococci into minute wounds or abrasions of the skin.

We first notice a minute vesicle whose contents change into pus and soon becomes yellow covered by a brown crust. Upon the scalp the hair will be glued together and crusts form in great number.

Children suffer most often from this infection but adults are not seldom found to be infected in a similar way.

Symptomatic Folliculitis or Infectious Folliculitis. This is often characterized, when isolated by a cicatricial depression surrounded by a reddish circle with a zone of alopecia.

When it is conglomerate, it often produces an infiltrated mass of perifollicular tissue, and a hard tumefaction on the scalp.

In the kerion, the lesion resembles a macaroon, from which issue, as through the holes of a sieve, hairs surrounded by pus.

FURUNCLE

Another infection caused by staphylococci which occurs on the scalp or at least in its immediate vicinity causing loss of hair, is the furuncle.

It differs from impetigo only in degree, as the inflammation here assumes greater dimensions and invades the derma itself. Also the location differs from that of the other for here the sudatory and sebaceous glands are involved in the process.

The hair border at the back of the neck is the favorite location, where friction from frayed and defective collars very easily causes abrasion of the skin. The great number of sebaceous glands in this region thus irritated make it clear why furuncles should generally be observed there above all other parts.

Very seldom do we find furuncles upon the other parts of the scalp except in combination with pediculosis capitis (lousiness) in the lower types of humanity.

Children who are poorly cared for and poorly nourished may be the victim of furuncles, particularly where eczema has invaded the scalp.

IMPETIGO

Impetigo Contagiosa of Tilbuy Fox. This impetigo makes its appearance in large blisters rarely seen, which become rapidly pustulous, covering the entire head or face. These pustules show themselves under the form of concretions of yellow matter, hard, adhering to the hairs, pasting and entangling them without changing them. Under the crusts there exists a

FIG. 65.—Impetigo of the scalp.

diffuse suppuration, due to streptococci contagion and often accompanied by conjunctivitis or rhinitis.

Granular Impetigo. Nearly related to the above is another form called granular impetigo, because it is characterized by the presence upon the hairs in certain places of yellow crusts, grayish irregular, dry, hard to the touch, more or less conglomerate, adherent to the hairs and concealed among the hair. If these crusts are abundant they form upon the head, principally at the back of the neck, a hard mass which to the touch gives the feeling of a series of irregular

lumps, out of which the hairs issue. On pressure, pus gushes out. Among the hair parasites are seen, upon the hair are nits. An intense itching extends from the shoulders down to the back, where there are furrows from scratching and papulous crusts of prurigo. Below the crusts the scalp is excoriated, red, and bleeds easily. There exist numerous large occipital ganglions which may suppurate. The hairs bordering on these pustules are destroyed.

TUBERCULAR DISEASES OF THE SCALP

1. **Lupus.** Lupus is characterized by the presence of the typical lupus nodule and is so very seldom seen upon the scalp in its primary form, that we need hardly take account of it.

However, when lupus appears upon the face near the hair border, it may invade the scalp and do fearful damage to the hair growing apparatus.

2. **Strophuloderma.** Strophuloderma attacks young people, taking its origin most often from tissues affected by tuberculosis, which are seen below the derma. Rarely it is caused by contact or by way of the circulation. Ulcers and fistulous passages are formed in the course of time.

Upon the scalp the favorite location of strophuloderma is on the posterior part near the ear, whence the tubercular process often extends from mastoiditis of tubercular origin or from tubercular glands in the region of the nape of the neck.

3. **Tuberculosis Cutis Propria (Miliary Tuberculosis).** The miliary form of ulcerating tuberculosis only in extremely rare cases, appears on the scalp as the localization of this variety naturally must be at or

near the openings of the body, be it mouth, nose, anus, etc., according to whichever part of the patient is infected by the tubercle bacilli.

Lupus Erythematodes. It is customary to count among the tubercular diseases of the skin the well-known affection, lupus erythematodes.

To recognize it early on the scalp is important, as it is located there almost as often as upon the face, and, just as when in the latter location, it is frequently accompanied by eruptions.

Here we see round, bare patches of white atrophied skin whose circumference shows the characteristic follicular changes of lupus erythematosus as follows: The follicles stand out more distinctly than normally and upon their exit rests a scale attached to a horny cone, which fills up the dilated follicle. Sometimes the enlarged follicle opening alone is seen. The marginal zone may be reddened and be above the level of the surrounding epidermis. The lesions progress slowly, inflammatory processes appear first and are soon followed by atrophy. However there is no typical picture of lupus erythematodes, all forms possible may be observed. We may even find patches of it which are only reddened by inflammatory action and covered by scales. These may disappear and leave no trace of atrophy. Neither is atrophy present in the acute disseminated forms.

RINGWORM

(Herpes Tonsurans, Trichophyton)

Ringworm is recognized as being a children's disease, and disappears when the age of puberty is reached. Alopecia trichophytica is connected usually

FIG. 66.—Ringworm, trichophyton tonsurans on scalp of negro boy, before and after vaccine treatment, by Professor Strickler of Philadelphia.

FIG. 67.—Cases of ringworm before and after vaccine treatment by Dr. Strickler, Phila., Pa.

with the macular form of herpes tonsurans. According to the latest researches there are two different forms of ringworm.

Microspory. This variety of ringworm causes

FIG. 68.—Trichophyton ectothrix, fungus outside of the same.

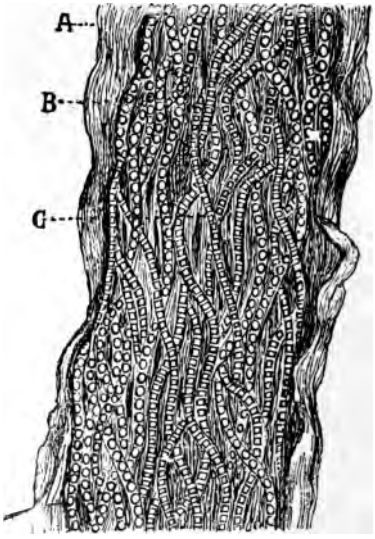

FIG. 69.—Trichophyton endothrix, fungus in inner structure of hair. *A*, hair; *B*, fungus trichophyton; *C*, trichophyton filling up interior of hair shaft, hence the name endothrix meaning inside the hair.

circles of scales, spots looking as if strewn with ashes. On them as well as in their vicinity are found numerous grayish white stumps of hairs and remains of broken hairs. Where these hair stumps are found in great numbers, they are essentially characteristic of alopecia trichophytica or ringworm. Their appearance is caused by the fungus destroying the hair

and making it break. The hair shaft changes color, because, as the microscope shows, it is enclosed in a white sheath. The hair looks dusty. This is the form of the disease which is confined to children and is highly contagious so that it becomes epidemic in

FIG. 70.—Favus fungus on scalp.

FIG. 71.—Favus spores with air bubbles.

families, schools, etc. Generally there is to be found on the skin where there is no hair, either macular or annular herpes tonsurans. The course of the micro spory is of long duration. Increasing along the circumference and by confluence or merging with other patches the baldness grows apace.

Microsporic Trichophyty. A different picture is given by microsporic trichophyty. Here too, the hair is broken but it is not discolored. The skin shows little change, resembling alopecia areata; it is

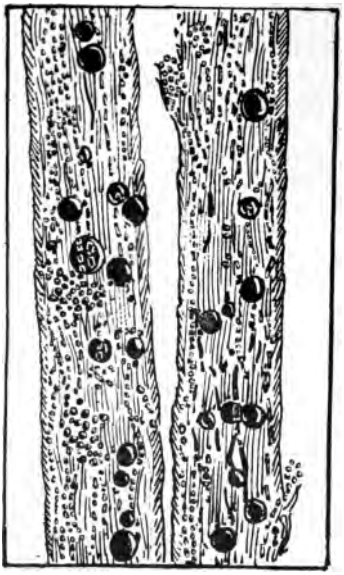

FIG. 72.—Favus spores with air bubbles.

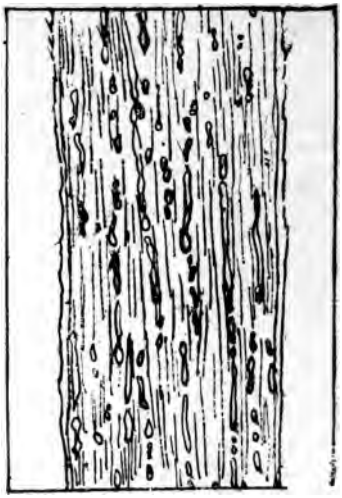

FIG. 73.—Favus spores with air bubbles.

smoother, with very few scales, because only the hair is permeated by the fungus. This kind attacks adults as well as the young, appears also to be less contagious. Both forms cause intense itching.

Besides these most usual forms, there comes a variety on the scalp much like the one often found in the beard in sycosis parasitaria (trichophyty of the beard) which shows on one side round festering knots, like a boil or a furuncle, on the other side, flat, dis-

tinct, hard, painful papules with festering follicles.

The cause of alopecia trichophytica are the various kinds of fungoid growths that we have learned of through the works especially of Sabouraud. And it is indeed true that each form shows a particular clinical picture. We cannot enter into a more exact description of the microscopical and culture differences here, because the practitioner scarcely is inclined at present to test them in single cases. Besides their cure by means of clean cultures is no difficult task.

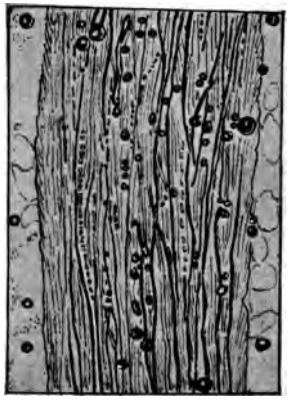

FIG. 74.—Favus spores greatly enlarged.

The diagnosis is not always easy; the surest proof is of course the fungus found in the hair and the scales. It can often be proved if these are rendered free of grease by placing the specimen in alcohol and ether and examining it in potash solution.

The growth of threadlike fungus in the hair, if laid in chloroform, assumes a grayish white appearance. The scales and hair from which the grease has been removed may be colored in an alcoholic eosin lotion, before examining them in potash solution.

Of clinical moment for the diagnosis are; the dry scaly layer and the hair stumps and the intense itching.

The prognosis even in very obstinate, long continued cases is almost always good and as a rule the hair grows again.

FAVUS

Favus is characterized particularly by disks depressed at the center, of a sulphurous yellow color,

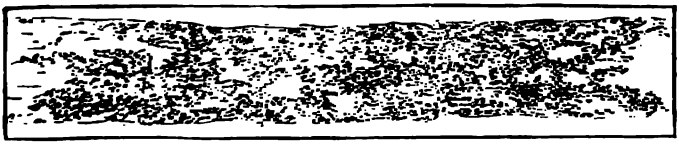

FIG. 75.—Microsporon pervading entire hair.

of a miliary form, size of a lentil, forming cups with a hair in the middle devoid of all luster. The hair is gray, atrophied, more or less crooked, easily pulled out; its bulb is swollen, transparent, with an unpleas-

FIG. 76.—Favus patient's scalp.

ant odor. With these cupped crusts there exists an erythematous redness; they occur separately but may run together in disks or crusts. If the cup is not present, the favus is diffused and takes the appearance of pityriasoid lesions, that is, yellow scales under which the scutula are found.

The typical favus lesions, whether cuplike or diffused, have a peculiar odor like that of a mouse, and are characterized by threads and irregular spores among the hair crusts. The favus contributes to the production of depressed cicatricial areas.

CHAPTER V

LOSS OF HAIR

The patients suffering from loss of hair who come to a physician, can be divided into three classes: The first suffers from an acute falling out of the hair. The second from an ordinary chronic falling out of the hair. The third, from a combination of the two.

Acute Hair Loss. Acute hair loss is more frequent among women than among men. Typical cases usually show that for several weeks previous to the examination an especially great hair loss had occurred. The quantity of hair falling out during twenty-four hours is counted and severe cases show an almost incredibly large number. In lighter cases up to several hundred hairs were counted, several times 1600 in one day. If the head really carries only 40,000 hairs, as some authorities assert, complete baldness under these circumstances would occur inside of twenty-five days.

Among the fallen hairs by far the greatest number are long. Very often the number of short hairs amount to not more than 5 to 10 per cent. Most of the long and strong hairs show the sudden thinning at the root.

Examination should now be made of several good, not too long, hairs which have grown thinner at the root end and contain marrow, taken from the healthiest portion of the head, also if possible, several white

hairs from the temple or from the back of the head, because there the strongest, and also the hairs which are surest to be yet growing, are found.

Interruption of the marrow, or a distinctly visible reduction and discoloring of the hair respectively, is to be expected at a distance of 3-5 mm. from the root end. We find in these cases an interruption extend-

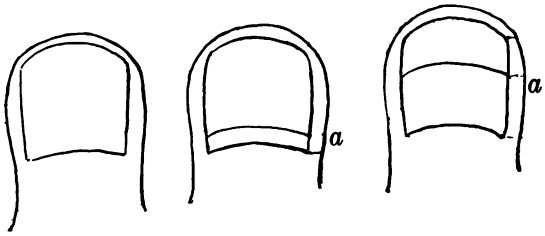

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FIG. 77.—Finger without Beau-line.

FIG. 78.—Finger showing Beau-line at *a*, proving severe illness has attacked the patient a few weeks before.

FIG. 79.—Beau-line at *a* has moved up near to the end of the nail showing illness probably six weeks before.

ing from 7 mm. to a distance of about 50-57 mm. from the end of the hair.

In one typical case where the investigation took place on November 1st, we asked if between the 20th of July and the 3rd of August an acute disturbance of health had not taken place. We received a full confirmation of our assumption derived from the investigation.

In this case the patient had been confined to her bed by a fever lasting for fourteen days from the middle of July. Cause of this fever was not ascertained, perhaps severe perityphlitis, a postpuerperal mastitis, a pneumonia, or even an acute indigestion.

From these facts we draw the conclusion that there occurred, first the growth of the hair in the new-formed tract of 0.5 mm. daily; then the new young hair which had started to grow and was already visible in place of the rapidly falling out old hair, and finally, as a **proof of the correctness of our diagnosis,** based on the examination of specimen hairs, we find in the nails the **formation of a Beau** (who first described it) **line,** i.e., of a sunken horizontal groove on all the nails, strongest, however, on the nail of the right thumb and index finger, with a distinct beginning at the front about 2 mm. long.

This line was necessarily located forward from the middle of the nail, because with a nail growth of somewhat more than 1 mm. daily the part formed at the beginning of the sickness (20th of July) was pushed forward somewhat beyond the middle of the nail, at the time of examination.

In this case the result of the examination and the history of the case, conform so closely with the theoretical calculation as to prove the correctness of our assumption that acute hair loss seldom lasts longer than two months.

Chronic Falling Out of the Hair. The loss of hair may be heavy or light, according to conditions, and a prognosis cannot be given based on the total number of falling hairs; **heavy loss may be temporary** and unimportant, **while a light loss may indicate doubtful prospects for a cure.** Most patients state that the loss of hair has been noticeable for a long time.

Also in these cases the daily loss may amount to several hundred hairs and the ratio between the short and the long hair (of women) or between the pointed hair **hair** (of men) may not be more

than 25 per cent. short hair. A higher ratio is frequently found, of from 40 to 50 per cent. of too short hairs.

We find by the microscopical examination of a carefully selected hair, still growing and filled with marrow, no trace of a sudden and distinct interruption of the marrow and no circumferential reduction of the hair.

The absence of a reason for the fall, derived from the appearance of the hair itself, is proof that the falling out of the hair does not result from an acute weakening of the body, but that it is from a chronic lack of health, or more often, the cause lies in the skin itself—an inflammation of the scalp, beginning in most cases a very long time before it is shown to the physician. This is especially true when a visible loss of hair has already taken place.

Chronic loss of hair requires serious consideration, because treatment which is almost without exception, easy and successful in the case of acute loss of hair, it being only necessary to assist its natural tendency to heal, will not be sufficient to remove causes which have injured the hair for years.

We have to turn our efforts against almost unknown causes and can realize success only after a very long period, often several years, when the hair which was present at the beginning of the treatment has fallen out and been replaced by new and better hair. Patient treatment for several years is often necessary before a real visible improvement, and this is in accordance with the statement made in the beginning of this discussion that most of the hairs in our heads are from three to four years old, and that an equal

period is necessary to replace them with other and (perhaps!!) improved ones.

But the patience of most of the patients does not last as long. At the best they may be educated to a continuous simple hygiene of the hair, as we have been taught to care for our teeth from early youth.

Arteriosclerosis. Hardening of the arteries is in many cases the cause of chronic loss of hair. Hasty, restless, nerve-racking emotions, which bring on arteriosclerosis, have without doubt great influence on the hair-growing apparatus and must be considered in every case of chronic loss of hair as possible fac-

FIG. 80.—Medullary canal of healthy hair.

tors, as they certainly diminish the blood supply of the scalp.

The Complicated Loss of Hair. Much more frequent than the ordinary chronic loss of hair is the complicated hair loss where the ordinary case has become complicated by the advent of an acute affection, such complication can be recognized by the fact that:

1. The history shows, a moderate loss of hair, lasting for years, which has become serious during the last few weeks.

2. The hair, still strong enough to grow, shows the interruption in the marrow-canal which we found in acute falling of the hair.

3. After the abating of the increased falling out of hair, the old moderate loss with its known symptoms prevails.

The first point—the history of an ordinary loss of hair—is important, since the acute falling out of hair is also inclined, especially if not treated scientifically, to lead to a long lasting and extensive formation of

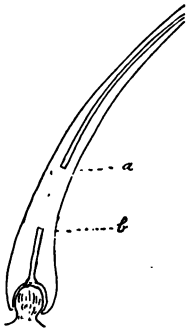

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FIG. 81.—Hair with short interrupted marrow fiber showing brief illness. *a*, upper limit of marrow canal without marrow growing during illness; *b*, lower limit of same and upper end of newly grown marrow after abatement of severe illness.

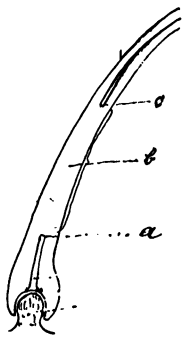

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FIG. 82.—Hair with long interrupted marrow fiber. *a*, upper end of newly grown marrow and lower end of marrowless space; *b*, marrowless space in hair during severe illness; *c*, upper limit of marrowless space.

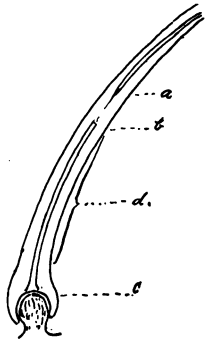

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FIG. 83.—Hair with short interrupted marrow fiber. *a*, lowest end of marrow where period of illness commenced; *b*, upper end of newly grown marrow; *d*, marrow which has grown since reconvalescence; *c*, lowest end of new marrow.

dandruff, i.e. to an inflammation of the scalp which, combined with seborrhœa, may start a permanent falling out of the hair of chronic character.

The Examination. We have investigated the form of the various kinds of the hairs of the head, chiefly determined by the use of the microscope. We have now to try to discriminate between the different forms

[illegible] hair with chances for improvement.

FIG. 85.—Same patient as Fig. 84 showing thin hair on temples.

of hair-loss, as revealed by ordinary observation. The observer should note the following:

(1.) The variety of the developing baldness (generally speaking only noticed on men).

(2.) The length of the hair (generally speaking only ascertainable with women).

(3.) Under certain conditions, the color.

Chronic falling out of the hair, or so-called baldness, starts from certain distinct points.

The three most conspicuous points are the front edge, especially the corners of the forehead, the region in front of and around the crown, and finally more rarely the part from the neck upwards. On the latter part it apparently sets in somewhat later and is generally not so distinct. Whether the loss of hair starts at the forehead or at the crown varies with the individual. According to my own observation it starts more often from the forehead in the form of larger development of the temple corners.

Very often however, the depletion begins simultaneously at both points. The temple hairs grow shorter until they attain a lanugo character, they become thinner and colorless. At the same time, the denuded corner usually begins to produce more of the fatty secretion, even to the formation of a fatty, seborrhœic crust.

This mounting of the corners, between the horizontal hair line of the forehead and the vertical line at the temples, is very frequent in men during late puberty (about the 21st year) and may be construed, as in the case of seborrhœa, either as a pathological symptom or as the result of a microörganism as yet unidentified.

CHAPTER VI

PREMATURELY GRAY HAIR—CANITES

As prematurely graying goes hand in hand with loss of hair and beginning of baldness, we give a brief consideration of the subject, based partly on a monograph by Dr. Guelpa, although not fully accepted by other writers on the subject.

It is quite evident that baldness and the graying of hair arise from absolutely different causes, which are quite independent one of the other. All will agree easily enough upon the superficial definition of grayness, as being a discoloration of the hair, but not so on the process which produces this whitening. In general it is admitted that the normal pigmentation of the hair depends upon the deposit among the cells of the scalp of pigmentary granules, incorporated in the fluids furnished by the deep and vascular parts of the follicle.

These fluids after spreading themselves from cell to cell, in every portion of the shaft, rapidly evaporate at its surface, the evaporation not being sufficiently checked by the normal oily sebaceous coating of the hairs. The diminution of the pigmentary production, depending upon different pathological conditions, or on its too rapid evaporation at the surface of the hair constitutes the habitual and normal process of graying.

Metchnikoff advanced some years ago another theory which is very seductive, but there are reasons

for thinking it erroneous, and that his therapeutical conception is certainly prejudicial. Do the large blood corpuscles swallow the pigmentary granules like highwaymen, according to Metchnikoff's idea, or are they simply employed as policemen, a means of ridding the pigmentary granules of an obstruction, or stopping their upward progress. The second way of looking at it ought to be the true one, in any case it is the most rational and we shall be quickly convinced of it if we will abandon theoretical speculations and confine ourselves simply to the most striking facts of graying, and upon the incontestable results of the means employed against it.

We have seen that the hair, born in the papilla, previous to emerging from the follicle, is bathed with an oily fluid, which accentuates its color, retards the destruction of the pigment, and increases the impermeability and the resistance of the hair to atmospheric influences.

This is why every time a cause acts upon this sebaceous fluid, the effect immediately shows in the intensity of the color and the vigor of the hair.

If a person who is beginning to grow gray, tries washing the hair with alcoholic or alkaline solutions, as Metchnikoff advises, he will find that the grayness advances more rapidly. On the other hand, regular washing followed by friction of the scalp with grease of some kind, as pure vaseline, oil of almonds, etc., so as to restore to the epidermis and the hair the greasy coating that the washing may have removed, will quickly show a diminution in the number of white hairs.

A proof of this is the fact that the hair of animals grows white first, long before the rest, on the parts

where they are oftenest wet, at the paws and the muzzle. This is why a man's mustache, which is most often washed with water and soap and exposed to the oxygen of the air, against which it is never protected, is always lighter in color, and more quickly discolored than the hair of the other parts.

The objection might be raised here, that if this theory were always exact, we could not prove the absolutely opposite fact, that is to say that the whitening of the beard comes regularly later than that of the hair of the head. But as a fact, even given the most elementary care, the beard is washed with soap and water at least once a day.

But on second thought, there may be found one more proof of the correctness of this theory. Because it must not be forgotten that the hair on the face is at least fifteen years younger than that of the head, and further, that the beard hair is not produced from a papilla, more or less compressed as is the case with the scalp hair.

Therefore, as the whitening of both follow each other within a space of a few years, it is evident that, in reality, from the effect of hygienic care, and frequent washing, the colored life of the beard hair should be shorter than that of the head. On the other hand, the hair of the pubis and under the arms, produced before that of the beard remains colored longer, because being always covered, it is relatively protected from the discoloring influence of the oxygen and humidity of the air.

From this cause, too, arises the fact that both grayness and baldness are less often premature and not so frequent among women as among men, for the reason that women do not wash their hair as often as

men do, and that they also do not wear hats which constrict their heads as much as do men.

Besides, we must also take into account the purpose of the hair. The hair is the natural means of protection and defence of the head from the heat and humidity of the atmosphere, if this natural covering, which is a bad conductor of heat, is removed the result is that the skin beneath is subjected to the effects of the surrounding temperature.

Allowance must also be made for rheumatic tendencies, thyroid influences and changes of the arteries, which change the fluids of the hair and end by exhausting its vitality. This is undoubtedly the principal cause of the premature hair loss and early graying among the arthritic, or gouty who more than others are inclined to feel the effects of atmospheric changes. And these unfortunates, in order to guard against their predisposition to premature baldness, or to cure themselves of this (moral and histological) disease, make martyrs of themselves by shaving their heads, or by energetic brushing, shampooing or douchings with cold water.

Doctors do not help nor give them really salutary advice how to treat their scalps, but leave them to the mercy of barbers and hairdressers, who from self interest and ignorance prescribe tonics, and more frequent washings with solutions, almost all alkaline or alcoholic.

It has been claimed—and it is almost a universal opinion, that the more abundant and vigorous growth of women's hair is due to nature rather than the result of more scrupulous care. This is another theory which no one has ever taken the trouble to examine. As a fact, the hair of a man is just as abundant and

just the same in appearance as that of a woman, which proves that the hair, like trees in a forest, can protect themselves more successfully if it is done reciprocally.

This fact should make us beware of the bad practice of shaving the heads of convalescents, with the view of preventing the loss of the hair. This is an injurious proceeding, because in addition to the disadvantage to a woman from an æsthetical point of view, it renders the head and even all the organisms more sensible to the assaults of heat and moisture.

The statements which we have made furnish us with some very important indications as to the scientific preservation of the hair.

To this end we should avoid first every obstacle to the liberty and activity of the circulation. Therefore, hats should be light and soft, and ought to be ventilated at the sides so as to permit the free action of the vessels of nutrition, especially around the temples.

Another piece of advice, not less rational, is to massage the scalp a little every day, to insure as much as possible the activity of the circulation.

Here permit a not unimportant digression. It is well known that women are afraid of using a fine comb when they see that it brings out the hair. They delude themselves with the idea that they can arrest the loss of hair by avoiding all violence with the comb. They never suspect that the hairs which come away with the comb are already decayed hairs, which could not continue to live, and which would fall of themselves, some days or some weeks later. Under these conditions it is much better to pull them out of the follicle as soon as possible, where they act only

as foreign bodies. The hair sprouts again more quickly after the plucking out of the dead hair, as physicians have had the opportunity to prove when the treatment of ringworm is done by epilation.

The principle is pretty well established that for every hair pulled out, another one more vigorous will

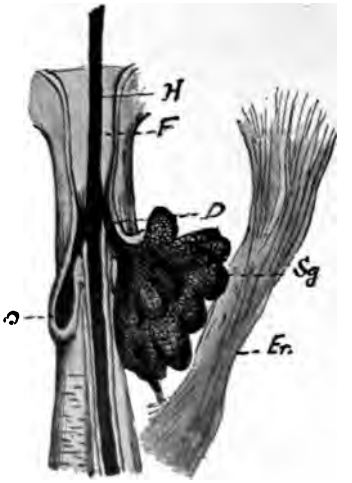

FIG. 86. Hair, vigorous and young. *H*, hair shaft; *D*, ducts which carry the oil to the hair within the follicle; *F*, follicle; *Sg*, sebaceous gland; *Er*, erector pili muscle.

take its place, but that every hair that falls out of itself is replaced only by another more feeble, and so on until its final disappearance.

It is not advisable to use alcoholic solutions for washing the hair, because they harden the teguments, and in consequence diminish their vitality, rendering the comedon harder and more resistant, and sealing it up still more in the strangulated follicle.

Further, by washing the head with the lotions habit-

ually used, or by hydropathic practices, the scalp is deprived of its oily coating, its natural protector. The result is that the skin is chilled and as a consequence causing lassitude and immobility of the muscle of the hair, not to speak of the discoloring and drying

FIG. 87.—Hair ready to leave follicle after separating from the papilla. The hair sits loosely in the widened follicle, liable to be removed by the slightest mechanical force, such as the comb or brush applied to the scalp. The papilla in the form of a ball rests free below and keeps on shrinking until the new, young hair starts developing.

action of these lotions, which rapidly deteriorate and whiten the hair.

The great inconvenience of these practices is much augmented by the bad habit of wearing the hair too short, its principal office being to protect the head against the changes of temperature and the humidity

of the atmosphere. In truth, if one wishes to denude his head of hair, he could not go about it in a better way.

Objections might be made to this statement by claiming that it would be very inconvenient to wash the head either with water or with solutions either alkaline or alcoholic, and that wearing the hair longer would be conducive of lack of cleanliness. But it is not difficult to prove how little ground there is for this objection.

For instance, do women wash their long and abundant hair every day either with soap and water, or even with alcoholic water? Every one knows that would be a very exceptional case. Have we any reason for saying that women are not just as clean as men?

Is it not well known that coquettish women in order to preserve the delicacy of their skin, especially of the face, never wash with water, but only use vaseline or cold cream for that purpose? This is of course contrary to our custom and presents certain difficulties, among others that it would be rather expensive, but it is undeniable that it is not opposed either to cleanliness or to hygiene. On the contrary nothing cleanses the skin so well of its impurities without provoking a too abundant desquamation and a consequent unfavorable dryness, than does some oily substance.

The defenders of the present hygiene may, with some semblance of reason, object to this, because undoubtedly they may observe a diminution of the fall of the hair, and even a new growth following the use of alcoholic or alkaline washes, or of ordinary antiseptics.

This fact is easily recognized, but, unfortunately,

this result is not lasting; it only serves to produce an illusion while hiding the ultimately disastrous effects.

If you whip a horse, who fatigued, slackens his efforts, no doubt under the impression of the painful blows, he will have a spurt of energy and will appear more alert and more vigorous. If you continue this system, however, do you imagine that your horse will live longer and that on the whole, he will give you more work. Certainly no one would like to assert this.

It is the same thing with the papilla which produces the hair. Under the influence of violent irritation the papilla may for a short time acquire an ephemeral extra growth, which gives place after a short time to an impoverishment, twice as severe from the ultimately hardening effect of the means used.

A lesson may be learned on this subject by an experiment which has been made in the vegetable kingdom.

Compression of the hypertrophic sebaceous glands being most probably the principal cause of grayness, a trial was made of placing around some branches of a tree a moderately tight band of non-expandable wire, in such a way as to restrain the circulation gradually, as the branch grew, but not to interrupt it suddenly or completely, and it was thought there would be a progressive diminution of the color of the leaves of the bound branches. But to the contrary, instead, the color became a little deeper and more vivid than the leaves on the other branches.

This result was at first puzzling, till afterwards on further reflection, the conclusion was reached, that the first effects of the band around the branch would be temporarily to increase the circulation, before its

definite effect was produced, which would finally cause the decay and fall of the leaves before those on the other branches.

And this was, in truth, the case, for when autumn came the leaves on the branches, which were bound, withered and fell much sooner than the rest, which remained green for a long time after, and later when the buds on the bound branch began to develop, they were small and more undeveloped than those on the other branches.

This experiment seems to be a sufficiently convincing reply to those who base their advice to use these means (alcoholic solutions, etc.) upon the temporary and apparent regrowth of the hair, which logic and science show can only destroy it.

In order to explain the sudden arrest of the hair loss, which is observed as a result of this treatment, it must not be forgotten that the hairs which are about to fall are those which have a complete bulb, club hair, that is to say, separated from the papilla, although still imbedded in the depth of the follicle.

Naturally, in applying these drying preparations (tonics containing alcohol, etc.) to the scalp, the channel of the follicle closes tighter at once round the dead hair, which in consequence may appear slightly more firmly implanted, like a dead tree which remains more firmly fixed the tighter the ground is pressed around it. But this apparent advantage is only temporary. The fall of the hair does not delay in continuing its fatal progress, with more evident and definite accentuation of the baldness.

It has thus been shown how baldness and grayness are in a large part due to local causes, which could be improved and deferred. It must not be supposed that

the general conditions of the health are not to be taken into consideration. It is here, on the contrary, that really we recognize the prime moving cause for the loss of hair.

Here it is that above all the overwhelming influences of the gouty (arthritic) condition manifest themselves which by the acid changes they cause in the tissues and humors, alter the contractibility of the vessels, and favor the solidification of the sebaceous secretions, and hence are the first cause of the aging of the scalp. The same condition prevails after long and serious illnesses, which are very often followed by temporary baldness.

These influences come under the domain of general pathology and therapeutics. We recognize and acknowledge its primary importance. But without neglecting to take the notice of this, which it deserves, it will not be entered into here.

CONCLUSION

From the preceding facts and reflections, the following deductions may be drawn.

1. Grayness is the discoloration of the hair, determined by the morbid compression that the layer of hardened epidermis, the plug and the hypertropied sebaceous glands exert upon the hair shaft, by obstructing the pigment granules.

2. Baldness is the expression of the death of the hair by atrophy of the papilla, caused by the insufficiency of the normal circulation, either by toxines or by the progressive compression consequent on the hypertrophy of the sebaceous glands, and to the increased development of the layer of adipose tissue.

3. These two conditions, so differing at their point of departure, when combined as they usually are, form together the most perfect sample of the aging of the scalp.

4. The present hygiene, based upon the application of water, alcohol, alkalines, acids and antiseptics, is fatal to the life of the hair, and should be abandoned altogether, except in special and exceptional conditions.

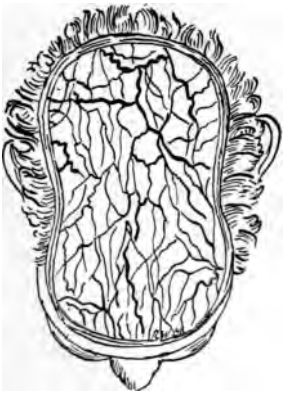

FIG. 88.—Showing the immense amount of blood vessels supplying the needs of the brain in contrast with the meagre supply of the scalp and the hair-growing apparatus, which is carried by three little arteries. Fig. 52.

5. The rational means really useful for the preservation of the hair and its color should have for their object:

(a) Promoting the circulation of the scalp, which is very meagerly supplied with blood compared with the abundant supply of the brain, by avoiding all constriction.

(b) Encouraging the suppleness and elasticity of the scalp, by cleansing and simple frictions, or by thorough massage by aid of some oily body, which will take the place of the natural oily coating, preventing the formation of plugs, or by assisting their expulsion, will reëstablish the normal functions of the sebaceous glands.

(c) Carefully avoiding the causes of chilling of the head; to this end it is necessary to give up douching the head and the pernicious custom of cutting the

hair too closely. On the contrary, it should be allowed to grow (a few centimeters) a little longer, so as not to deprive the scalp of its natural protection.

(d) Not to neglect the general cause, above all athritis, which conduces to grayness and to baldness, and to give them, without delay, and with the perseverance necessary, the special treatment indicated. Apropos of this, it might be mentioned that the local cure will be accomplished with more advantage if it is reënforced by the administration of organic extracts, particularly orchitines, and still more by prosecuting the cure for the renewal of the tissues.

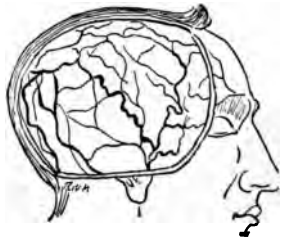

FIG. 89.—Blood supply to scalp.

(e. Added by the author.) Dr. Nagelschmidt (Berlin) has reported that many of his cases, which were treated by him for various diseases of the scalp and who were at the same time getting prematurely gray, had after the treatment by the quartz lamp (modification of Kromayer's lamp) a return growth of pigmented hair, making them appear younger by many years than before the beginning of the light treatment.

The same result has been my good fortune to achieve in some of my cases treated within the last two or three years.

CHAPTER VII

HYGIENE

Individual Hygiene. The style of wearing the hair, the diet, the manner of living, the want of exercise, the occupation, the cares, the ambitions act upon the nutrition of the scalp, either directly or indirectly, through the medium of the nervous system and the general circulation.

If to this is added the local parasitical troubles, the ordinary infections and intoxications one can easily understand that, in the hygiene of the scalp, the hygiene in general occupies the first place and that the special hygiene should be above all; preservative, conservative or curative.

1. **Preservative Hygiene.** According to the age, the sex, the habits, the general health, the hereditary and acquired predispositions, the condition of the scalp.

The care proper for infants will not be entered into here, as it is fully treated in other works.

Proper Care for a Man's Hair. It is of benefit to keep the hair short. Some authorities say that cutting it short or half short regularly strengthens it. Clipping gives the hair an abnormal direction and pulling it conduces to its falling out. Hats or caps kept constantly on the head, by depriving the hair of air, act in the same way.

Hair Dressing Establishments and Barber Shops. Both are, or have been, headquarters for spreading hair and scalp disease. In recent years the condition

and the habits of the employees of these shops have been greatly improved.

When it is known that ringworm, favus, pityriasis (dandruff), syphilis, acne, impetigo, carbuncles and furuncles, sycosis (barber's itch), and last, but not least, pediculi (lice) are diseases formerly frequently acquired in ill-kept barbershops, it would seem that for their own protection hairdressers would enforce certain strict rules of hygiene to protect their customers, themselves and their business.

The man who wants to lay his hands upon your face and scalp should wash his hands before doing so, and should clean his nails with a nail brush and tincture of green soap.

His clothes should be clean, his towels fresh from the laundry or the sterilizing apparatus.

Fresh paper napkins should protect the back of your head. Your own cup, brush, soap, comb and brush should be at your disposal, cleansed and disinfected after each use.

Allow no powder puff to be applied to your face. Razors, shears and hair clippers should be dipped into boiling water containing borax or bicarbonate of soda.

Avoid the barbershop where customers with a skin disease are being treated, unless it be a non-contagious case.

Care Proper for Women. The loss of hair is due largely to the manner of dressing the hair.

The more the style it is worn in influences the direction of the hair, the more the nutrition is impeded the more the loss is accentuated. The hair must not be subjected to pulling and twisting or bending at sharp angles which tend to break the hair.

The style of wearing the hair should often be changed. It should never be tightly tied; too many metal pins or combs should not be used; hats which cover it closely depriving it of air must not be worn; false hair must be avoided, also crimping and curling the hair with hot metal appliances.

Morning and evening the hair should be brushed and combed, after dividing it into several strands; while brushing it should be held near the roots to prevent pulling it; brush slowly and gently.

At night it should be loosely braided in several braids, and allowed to hang without tying it. If possible it should be let down and allowed to hang over the shoulder for some hours during the day.

Young women and girls experience physiological sheddings of the hair, which are of no importance; they are normal. There are also some sheddings which are caused by the genital functions, menses, pregnancy, etc. They recover without special treatment.

Hygienic Cares Proper at All Ages and for Both Sexes. The proper care of the hair is the same for both men and women, but the technique is different for women, on account of the thickness and length of their hair.

When the hair is long, in order to reach the scalp, it is necessary first to part the hair and apply the hygienic or therapeutic agent at these partings by means of a small stiff holder, in order to rub it in thoroughly.

For this purpose cotton at the ends of the fingers or held by nippers, a brush, a piece of wood cut to the right size, may be employed, but whatever is used

must not wound the head, and should be perfectly clean.

Sterilized cotton is the best means of applying liquids, pomades or mixtures.

Neither the scalp nor the hair should be moistened with cold water which changes the color of the hair, and may give rise to chills or local congestions.

If plain water is in a general way bad for the hair, it would naturally be supposed that salt water would be equally so, but in some countries it is used for the hair.

The conditions of climate and diet must be taken into account as well, when the loss of hair follows a stay at the seashore. The hair should always be thoroughly dried with a towel, always rubbing the same way.

In a normal condition, the hair is smooth and glossy; if taken between the fingers it is neither greasy nor dry, when one hair is rubbed against another it produces a slight crackling sound; the end of the hair is blunt, notched obliquely.

The normal scalp is white, smooth, neither greasy nor humid; it does not soil nor moisten the fingers or cotton; to the touch it gives the sensation of tension and resistance; taken between two fingers, it is difficult to lay hold of and is not easily separated from the bony surface.

The object of the hygiene is to maintain the hair and the scalp in this condition by means of lotions and washes, which cleanse; by means appropriate to the dry or oily condition of the hair, or the dry, greasy or scaly condition of the scalp.

Conservative Hygiene. Washing the scalp and the hair. The head should be washed as soon as the scalp

is dirty, every fifteen days or at least once a month, according to the business or the mode of life.

The simplest methods are often the best; soap, preparations with a soapy base, alkaline mixtures, and preparations of ammonia give excellent results upon healthy scalps.

The following are some of the simplest lotions or shampooing mixtures:—

(a) Hebra's Alkaline Soap (fluid) or Tincture of green soap.

(b) Boiled water .....500 grammes
with the beaten yolk of an egg.

(c) Lime water .....500 grammes
and yolks of three eggs.

(Jackson)

Shampooing. The proper method of shampooing the head is as follows: First, thoroughly wet the hair with warm water. Then take a good soap that lathers easily. Make a thick lather on the hands and rub vigorously into the scalp.

Wash out with a copious stream of water, where there is no other means of doing this a pitcher or watering bag, with the hose removed, may be used by another person to pour the water over the head. Rinse well with cool water. The hair should be rubbed dry with **hot** bath towels, changing them as quickly as they moisten.

Care should be taken in drying the hair, especially with women, who should sit before an open fire or in the sunlight when doing it, and should not dress the hair until it is perfectly dry. The hot air from an electric drier is not good for the hair. A fan may be

used if it is necessary to hurry matters. It is best for a woman to have some one else wash her hair. To remove the last trace of moisture rub in Cologne spirits.

After the hair is dried, if it remains dry, easily broken, difficult to comb, it is sufficient to dip a soft brush in some pure olive oil, or the palm of the hand may be used and the oil rubbed in gently, avoiding any excess of oiliness, which may be prevented by pulling the hair between a towel moistened with cologne or chloroform.

Curative Hygiene. Each variety and color of hair should receive its own peculiar care. Before advising the use of certain agents, it should be observed that they alter the color of the hair; oil darkens it, ammonia, also resorcin, discolors it or reddens it slightly.

Hygiene for Dry Hair. Dry hair becomes very brittle, breaking and falling out, and scales are formed.

Repeated washing is bad for dry hair. It should not be done often, soap or alkaline substances only should be used, very rarely alcohol.

Oily substances should be applied in moderate quantities, using either the hand or a soft brush for this purpose. The best preparations are made of olive oil, oil of sweet almonds, vaseline, beef marrow, to which may be added some aromatic essences.

There is often found in connection with dry hair an anæmic condition, dyspepsia, malnutrition, utero-ovarian and nervous troubles, so the first indication is to improve the general condition.

The second indication is to tone up and excite the scalp by irritants and tonics (pilocarpine, cantharides, quinine).

Hygiene for Oily Hair. Oily hair is often found ac-

companied by a greasy condition of the scalp, called steatidrosis or oily seborrhœa.

In this case the hair should be washed often with Hebra's alkaline soap or soft soap, and the use of preparations of alkalines (borate of soda, bicarbonate of soda) is indicated.

According to Brocq, preparations of ammonia are excellent. These must be used with care as they are inflammable. It is also advisable to powder with inert powders, oxide of zinc, or starch and orris root powder, leaving it on for some hours and then brushing it out.

Hygiene for Dryness of the Scalp. The same means are indicated as for dryness of the hair. Besides this, some modifying preparations must be used, of which the principal are tar, carbolic, and salicylic acid, incorporated with some oily substance, which stimulate the circulation of the scalp. (See Formulary.)

Hygiene for Oily Scalp. Soapy washes may be used, alkalines as borate and bicarbonate of soda, friction with oil alone or with alcohol or volatile oils, lotions and friction with ether and alcohol. Pomades with a base of glycerine and lanoline, with the addition of sulphur and salicylic acid are the best. (See Formulary.)

Hygiene for Perspiring Scalps. Scalps which perspire freely should be washed often with lukewarm water diluted with alcohol or aromatic vinegar. Friction with the brush dipped in some solution such as salicylic acid or naphthol, and pomades with the same base should be used.

If the transpiration is excessive, powder every night with an inert powder (orris root). With men, the

hair should be kept short; with women the hair should be aired as much as possible.

Hygiene of Simple Pityriasis or Dandruff. This condition is found most frequently; it accompanies dryness of the scalp and hair.

Pityriasis increases with every infringement of the rules of hygiene, alimentary or otherwise; cleansing too often or using irritating washes; social habits, confined life, want of exercise, as the result of overwork, of illness, nervous troubles, disturbance of nutrition; it is found frequently in connection with chlorosis, utero-ovarian diseases, sexual disorders. Hence the necessity for a general hygiene and of treatment of the cause.

For dandruff the treatment is the same as for dry scalp, alcoholic rubbings must be used sparingly. They dry the scalp and so increase the scaling. The use of mercurial preparations, and lotions with sulphur is indicated. Oil of pure vaseline, pomades with sulphur, tar or salicylic acid.

Taking into consideration the physiological action regulating the nutrition of the hair, the secretion of sebaceous glands, the secretion of the sudoriferous glands, the composition of the hair color, the sebum and perspiration, we come to the following conclusions:

The condition of normal vitality of the hair depends on manifold physiological states, on the structure, the normal function of the hair lobule and the organization. They depend therefore upon the habits, the mode of life, the nutrition, the nervous condition and the general health.

In order to change the condition of the hair by local action one must consider the chemical composition of

the hair, the function of its glands, and by hygienic rules and treatment just laid down approach the normal state as much as possible. The chemistry of the stomach must also be considered.

Combs and Brushes. Combs, which should be

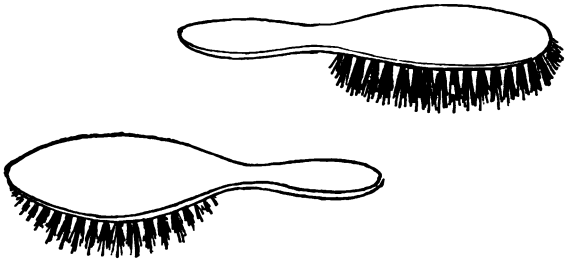

FIG. 90.—The perfect hair brush.

coarse, and brushes which should be moderately stiff and having higher bristles in the center than at the edges, must be kept scrupulously clean and every person should have their own particular brush and comb, because a person who has no dandruff, or in other words does not suffer from seborrhœa in any form, is

FIG. 91.—Arrangement of bristles in a perfect brush.

liable to contract it by using the brush or comb of one suffering from this trouble.

When washing brushes care must be taken not to immerse the brush in the water; it should only be dipped into it. Some ammonia should be put into the water, as by this means the grease in the brush can be best removed. The water should be warm, but

not hot and the brushes should finally be rinsed in cold water. A good plan is to hold them under the cold water faucet and allow the water to run through them. Then they should be thoroughly dried in a draft. If not stiff enough after washing a rinsing in a weak alum water will improve them, about one ounce of alum in a basin of water.

A correct brush should have bristles standing up higher in the center than at the edge, the same being placed in bunches not too close together. The individual bristles in these bundles should also be arranged so that the higher ones are in the center or the shorter ones on the circumference. It is because the bristles must penetrate to the scalp and by this means the scalp will be kept clean.

For finishing the hairdressing a finer, softer brush may be used.

The comb should have large teeth far apart. A fine comb should never be used except for the removal of vermin.

HAIR POINTERS

Daily growth of hair, ½ mm. 0.5 mm. (2½ inches in 10 days).

A single hair grows slower towards the end of its growth.

Growth is quicker in middle life.

Some dyes retard the growth of hair. Some stop it altogether.

Cutting or shaving does not accelerate growth.

Forehead hair grows only 12.8 mm. long.

Temple hair (2½ inches) 11.0 mm. in length.

Average on every part of head (3 inches) 15 mm.

Dry hair needs oil, pomade or vaseline.

Oily hair needs orris root or any other innocuous powder to dry it.

Life of hair, 2 to 6 years.

The longer the type of hair the faster the growth.

Hair grows faster in the beginning of its growth.

Every 10 days 1 to 2 lines, 1/12 inch to 1/6 inch or 2-5 millimeters.

After 2 years, 10 to 14 inches long, it grows slower.

At the end, you find a little growth every sixth week.

Cutting hair makes it grow slower.

Hairs grow in groups of three and four.

One of the four grows faster than the other three.

When one of the four falls out, the others grow faster.

They also grow thicker, stronger and darker.

Shorter hair grows on the temples and edge of scalp.

GENERAL RULES

Don't fuss with your scalp unnecessarily.

Do what you are told by the specialist.

Do not indulge in excessive or unnecessary massage and shampooing. brushing, rubbing, galvanic or faradic electricity.

Give the scalp a rest!

Spray scalp with water only sufficiently to remove loose dust and dirt.

Every three or four weeks a shampoo is allowed.

Use tincture of alkaline soap, Prof. Hebra's soap or castile soap only, and no other.

Eat well, digest properly. Keep bowels open.

If necessary take a tonic containing iron internally.

POINTS FOR LOCAL TROUBLES

Go to the physician at least two or three times a month. If itching is bad, oftener.

Scalp feels oily, because of too much shampooing, use of improper soaps (medicated).

Irritating and stimulating "tonics" used in barber shops cause greasy scalps.

Resorcin, an ingredient of most lotions, causes seborrhœa and greasy scalps.

Watch your scalp whether it is dry or oily. The one condition is only a stage of the other.

Dry scalps are easily improved. It is difficult to render an oily scalp dry.

Itching is often the sign of trouble coming, but because it is not intense, it is disregarded.

Itching is the forerunner of seborrhœa.

Dandruff is easily seen on dry scalps. Dandruff is obscured on oily scalps where it forms a greasy deposit.

Dandruff is the same as flakes of skin after inflammation anywhere on the body.

Where there is dandruff there must have been inflammation.

Too vigorous brushing or combing of scalp (not hair) predisposes to dandruff.

Irritants will cause dandruff.

Hair is not able to conduct any impression made at its periphery, towards its bulb.

Hair fall and hair growths depend upon the season.

Red hair, 35,000 cover the scalp.

Brown hair, 105,000 cover the scalp.

Blond hair, 150,000 cover the scalp.

Fever diminishes growth.

Soul emotions stop growth. They also diminish air cells in cortical portions of hair shaft.

In grave disease, Luftlücken (air cells) disappear from the marrow and hair grows translucent.

CHAPTER VIII

GENERAL THERAPY

The therapy for diseases of the scalp is:

1. To conquer the cause;
2. To combat the symptoms;
3. To facilitate the regrowth of the hair.

Overcoming the Cause. This permits of a variety of means, either external as: hydropathy, massage, electricity; or it may be internal according to the pathological indication: organic, antitoxics, constitutional, specific, or according to symptomatic indications, soothing, mitigating or tonic remedies, vasomotor, antiseptics, derivative or substitutive.

The treatment of the local cause must be in relation with its origin, and aim sometimes at the agent itself, sometimes at its effects. Generally it is seen too late, and the sufferer, except in some rare parasitical affections, pediculosis, for instance, does nothing till the disease is established.

The local treatments are medical, surgical, chemical, physical agents, as heat, light (Quartz Lamp), electricity, high frequency and Roentgen rays; surgical—scarification, curetting, scraping, epilation, cauterizing; where special remedies are called for, emollient, detergents, resolvent, antiphlogistic, soothing, substitutive, reducing, specific, glandular extracts (opsonins).

The scalp has greater tolerance than the rest of the tegument for energetic remedies, which sometimes are necessary because of the depth and persistence of the lesions. Like the skin, the scalp has its idiosyncrasies, which must be taken into consideration in order to avoid artificial eruptions from mercurial or similar preparations.

Therapeutic symptoms point out the treatment of alopecia, seborrhœa, pyodermitis. The treatment of alopecia is especially by exciting remedies.

For seborrhœa the treatment must aim at loosening the scales, preventing their reforming, and for this the following remedies are used: Detersive remedies: spraying, washes, lotions, soaps, oils and ointments, alkalies, which lead to the dissolution of the oiliness. Reducing and substitutive remedies (tar, iodine, mercury), which modify the local circulation and promote the fall of the scales: keratolytic remedies (salicylic acid, sulphur, ichthyol, pyrogallol, formol) of which the effect is the swelling, the detachment of the epidermis and its regeneration.

Finally the therapy for pyodermitis demands physical agents or minor surgery; cauterization, curetting, electrolysis, and above all these remedies: emollients (wet packs, lotions, sprays), dissolvants (rubber, plasters), antiseptics (mercurial, sulphurated).

REGROWTH OF THE HAIR

For this end the therapeutic agents used are as numerous as they are often ineffective. They are: Mechanical agents, friction, and massage.

Physical Agents. Electricity in the form of continued and interrupted currents, auto-induction, static

douches, light, quartz lamp, Finsen light, high frequency.

Chemical Agents. Chemical irritants, especially acids, whose action is to stimulate the circulation of the scalp, to produce a more or less intense redness, which may cause a blistering.

There remains further for the cure of diseases of the scalp, special means, such as epilation, and special remedies for local and general cases.

The different therapeutic agents will be considered under three divisions: electrotherapy, light therapy and medications.

ELECTROTHERAPY

Electrotherapy comprises: Franklinization, high frequency and radiotherapy.

Franklinization. Is used in the form of baths and static douches. The patient is seated upon an insulated stool, and subjected to a positive or negative shock of electricity. A negative shock has an exciting action, the positive a sedative effect. The sittings last from a quarter of an hour to twenty minutes and are repeated either every day or every second or third day. The length of the treatment must be sufficient to obtain a good result.

High Frequency. These treatments are generally given with one pole with pointed metal handles, cones, brushes or plates. The patient is not insulated. According to the effect sought for, there are used: (1) Brushes, in streams, exciting effect. (2) Cones, in friction, sedative action. (3) Points, in sparks, provoking revulsion. (4) Plates, by application, effect is analogous to a galvanic current.

FIG. 92.—High frequency machine for applying D'Arsonval-Tesla current.

In a general way, high frequency promotes the action of the vaso-motors. The longer and stronger the sparks, the greater the revulsive and caustic effect.

ROENTGEN RAYS

Radiotherapy is now much used by dermatologists in the treatment of diseases of the skin. It holds a very important place in the treatment of certain skin diseases, but on account of its possibilities for evil,

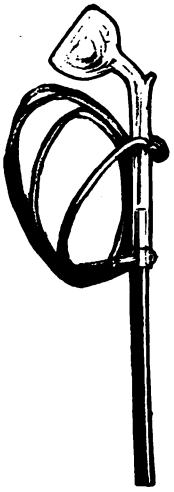

FIG. 93.—Monopolar electrode called "flat" piece and chord.

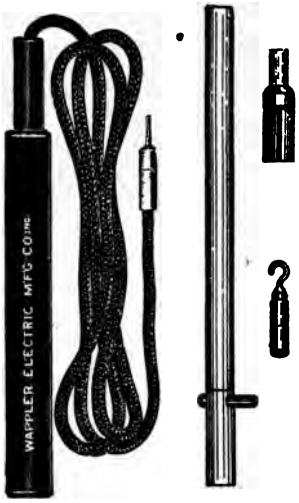

FIG. 94.—Chords and holders and hooks for monopolar electrode.

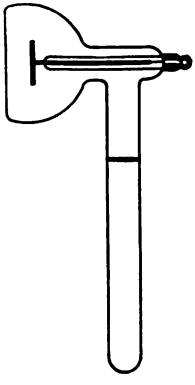

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FIG. 95.—Monopolar electrode.

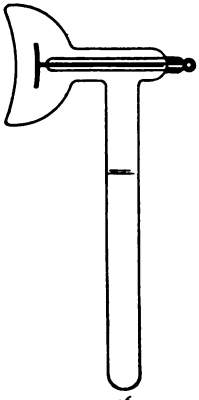

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FIG. 96.—Monopolar electrode.

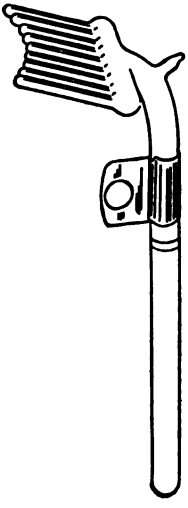

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FIG. 97.—Monopolar electric comb for long-haired patients.

both for the patient and the operator, it should not be used indiscriminately. A very important point to be considered in x-ray treatment is the proper protection of those parts not being treated.

RADIUM AND FINSEN

In place of the x-ray, radium and other radio-active substances have been highly extolled. It sometimes produces brilliant results when applied by those skilled in its use. It has special advantages, particularly that of convenience when used for small cutaneous lesions, or for cavities as the mouth, nose, etc. The application of concentrated light deprived of its heat rays, the use of which we owe chiefly to Finsen, has proved beneficial in cutaneous disorders. Its therapeutic field since Finsen's first experiment has been broadened, and it is now applied, in some of its forms, in lupus erythematosus, epithelioma, alopecia areata and other diseases.

THE QUARTZ LAMP TREATMENT

Among the many mechanical devices which have been used to aid the growth of hair there came into use some years ago cuplike glass vessels, fitting tightly the top of the head. Air pumps exhausted the air from these vessels on the supposition that the vacuum there formed would remedy baldness. The results were very negligible.

On the discovery of Roentgen rays they were tested for stimulating the growth of hair, with no particular success aside from destroying the fungus and favus of ringworm.

Kromayer's quartz lamp for the treatment of ir-

ritations and itching skin affections was the first successful agent in the field of constructive therapy and

FIG. 98.—Patient being rayed by suspended quartz lamp for deficient hair on crown.

effected numerous cures of ringworm and alopecia areata.

FIG. 99.—Lady patient being treated reclining on a lounge.

The next successful agent in the treatment of these diseases of the hair and scalp was the D'Arsonval-Tesla high frequency current. This at first received little attention, but later was championed by Chatalain in his "Maladies de la Peau," and many other authorities. I, myself, have used this treatment, and have been well pleased with its effects. It requires, however, innumerable applications, and alone is not always successful.

In 1913 Nagelschmidt introduced his modification of the Kromayer lamp, blazed a new trail in the domain of hair and scalp therapy and published his astonishing results in 200 cases he treated.

Nagelschmidt's Quartz Lamp. This lamp may be described as an electric arc in mercury vapor, in a quartz tube, inclosed in a spherical lamp body, mounted either on a stand, or in a hanging device, and provided with a rheostat. The burner consists of a shallow arch-shaped tube of translucent quartz glass, three and a half to four inches long and placed with the convexity upward. At each end is a small reservoir of mercury in a cylindrical tube which joins the arched shape tube in T fashion. The electrodes in lead covered wires, respectively red and white for the two poles, lead into the mercury chambers. To provide against overheating, each end of the two mercury chambers carries a fan-shaped series of metal plates or lamellæ which diminish the heat by radiation.

The lamp body which contains the burner, is a large hollow sphere, preferably of aluminum, either suspended from the ceiling or fastened to an upright rod on a tripod, so that it can be moved to any position. Two rods fixed horizontally to an arm on the inside

FIG. 100.—Lady patient taking treatment for loss of hair on crown.

of the lamp body carry the burner which can be tilted by a wheel outside. A current indicator shows whether the connections are correct. A sliding door

on each side enables the aperture to be varied at will. A folding screen of green cloth closes the lamp underneath. The chimney can be opened vertically or horizontally, the latter facilitates breathing the ozone.

The rheostat is attached to the column of the stand in the tripod type of lampholder. The hanging lamp has the rheostat attached to the wall beneath it. Mounted upon the rheostat is a plug of porcelain with which the lamp is connected, and a switch is provided for turning the current on and off.

Now, as to the application of the treatment.

Dr. Nagelschmidt reports a series of two hundred cases treated by him for alopecia areata, alopecia seborrhœica, prematura and senilis, and seborrhœa capitis. These cases were not selected for the purpose of showing the efficacy of his modification of the Kromayer lamp, but are consecutive cases from 1907 till 1913, accurately tabulated and controlled and published in his monograph in 1913.

They consist of 132 cases of alopecia areata, 53 cases of alopecia seborrhœica or prematura, and 22 cases of total baldness. All of the 53 cases of alopecia seborrhœica or prematura were cured.

Not only the itching and pain disappeared, but the scales were all removed, the hair was regenerated and new normal hair appeared in place of the old hair which had fallen out in the course of the diseases. Of the 132 cases of alopecia areata, 80 per cent. were cured; 16 improved, while 8 only remained unimproved. Furthermore, 22 cases of total baldness were treated and all were cured, except six cases, others were somewhat improved, and only a few not benefited at all.

Dr. Nagelschmidt in one case of complete baldness

FIG. 101.—Patient having both temples treated at the same time by Nagelschmidt's quartz lamp.

applied the customary treatment of local remedies, tinctures and ointments, as well as massage and faradization to one-half of the scalp and the rays of the quartz lamp to the other half. After a time an

excellent growth of hair was produced on the half that had been treated with the lamp, while the other half remained as bald as ever.

In many cases he has succeeded in bringing out new hair of the normal color of the person treated, in place of the gray hair.

Since I have had the opportunity of applying this treatment after studying the method in Dr. Nagelschmidt's clinic in Berlin, I have had 300 cases in my own practice, and I feel that it is not amiss for me to say that my experience has borne out my observations while abroad.

The procedure is as follows: The diagnosis of the scalp condition is made by the usual inspection. In cases of falling hair, the rate of loss is determined by counting daily for three successive days the number of hairs lost during the daily brushing and combing, and by noting how many of these hairs are long and how many are short. The long hairs are old and the short are young. Patients losing relatively many short young hairs present a poor prognosis. The sittings for treatment are so timed that about one furrow or "part" of the scalp is exposed to the rays at a time, the remainder being protected. The interval between the treatments must be long enough to allow for the subsidence of whatever reaction follows the application of the rays. The parts not to be exposed to the rays must be carefully protected—especially the ears, face and arms—against damage from the rays.

This method of treatment for hair loss is not one that can be adopted in general practice, as the apparatus is expensive, the technique must be studied and the treatment, though given in each case but once in

three weeks—is time consuming, usually extending over one or two hours with men and much longer, 4-6 hours, with ladies.

But the point I would particularly emphasize is, that this treatment gives the most definite and hopeful means yet known for ameliorating a condition which has hitherto proven obstinately refractory, and has been a source of embarrassment and discomfort to its unfortunate possessor.

CHAPTER IX

EXAMINATION OF THE SCALP*

Methods of Diagnosis. The diagnosis is made in three ways:

(1) By ocular inspection—diagnosis by impression.

(2) By studying the character and development of the malady—diagnosis of observation or clinical diagnosis.

(3) By microscopical examination—confirmative diagnosis.

(1) **Diagnosis by Impression.** It indicates only the actual condition, without looking for the cause, the development, antecedent and accompanying circumstances.

It is the diagnosis of marks and signs, and is based upon three essential conditions of the scalp—hair loss or baldness, seborrhœa or scaling, suppuration or pyodermia.

This portion of the diagnosis, often uncertain, does not serve for prognosis or therapeutic purposes. It is chiefly a sign post or way mark.

The hair loss (alopecia) is either complete or incomplete, partial, localized or general. It exists on a young or old subject, man or woman; it is a clear case or accompanied by desquamation, pityriasis or seborrhœa; with oily secretions, abundant sweats, sometimes both; sometimes one finds suppuration

* Method of Dr. Paul Gastou.

upon the hairless portion, localized, diffused and with scars.

Seborrhœa exists by itself. It is branny or scaly; dry or oily; clearly local in spots or general; where it exists there are healthy hairs or diseased ones, irregular, with swellings, dry and broken, atrophied hair sheathed with epidermis or forming bunches intermingled or sparse, more or less shortened and cut off as if they had been shaved.

Seborrhœa may also be accompanied by bare spots and suppuration.

Pyodermia or suppuration occurs in isolated areas in patches or confluent forms.

The hairs are in the center of the pustule, are glued together or transversely through the crusts. Between the suppurating focuses bare spots are found, seborrhœa, the skin eroded, oozing, healthy or bleeding below the crusts.

The eye must besides make sure, whether alopecia, squames or suppuration exist, also redness, tumefaction and animal parasites.

After the diagnosis by impression or observation is made, the touch comes to our aid to ascertain the relative thickness, laxity, consistency, dry or oily state, adherence of scalp to cranial bones, scales, crusts. At the same time the occipital, posterior cervical ganglion, superior and inferior periauricular and submaxillary regions are examined and their condition noted.

The eye must make an examination of the vicinity of the scalp, the face, the borderline of the scalp, the forehead, the regions back of the ear (often it will be found that at the beginning of a diffuse purulent seborrhœa or of a retroauricular eczema an otitis ex-

terna or media or a streptococcus invasion has taken place).

Finally, the nose, eyes, mouth and pharynx and above all, the teeth must be examined. This is important as we may discover syphilitic infection, malformation or hereditary disease.

This examination may show the presence of previous maladies, and also may disclose at the same time lesions of the face and neck analogous with those of the scalp.

All ocular investigation should end with an examination of the entire integument, which may reveal general infection and diffuse skin disease, of which those of the scalp are the principal or concomitant indications.

(2) **Clinical Diagnosis and Observation.** It is composed of:

(a) The examination of the general organs, auscultation, percussion, study of the nerves, reaction, etc.

(b) The history of the patient and the malady; antecedents, hereditary or personal; the diathesis, individual diseases, disorders and disturbance of development; infectious diseases, eruptive fevers, habits, overwork.

(c) An inquiry into the development of the disease, the medication received, the effect of internal administration of remedies or of the external applications, the possibility of lesions or accidental eruptions or of artificial ones, produced by remedies given or taken for any other cause.

(3) **Confirmative Diagnosis.** When the symptoms are so clear that there is no mistake possible, the microscopical examination has nevertheless the advantage of absolute precision.

This diagnosis should include the research into the general predisposing cause and the accidental local causes.

In the majority of cases the search after the predisposing cause is of more importance for the patient and the necessary prophylaxis than for the determination of the malady.

The rational diagnosis permits the establishment of the nutritive balance of the patient by the use of the scales, and it covers the shape, respiratory capacity of the lungs, the blood, the serous membranes, secretion, excretions and particularly of the gastric juice and the urine.

The microscopical examination at every one's disposal, applied (extemporaneously) no matter where, has considerable importance for the prophylaxis of scalp diseases, particularly with young children going to school.

ETIOLOGY OR CAUSES OF BALDNESS

The General Causes, predisposing and effective, may be:

(1) General diseases, either of toxic or infectious origin, caused by faults of nutrition or affection of the nervous system, or acute diseases which will particularly influence the scalp, changing its structure or interfering with its function.

(2) Hereditary, through microbic influence, toxines, vascular and nervous disorders causing modifications in the ecto- and mesodermic layers and resulting in atrophy or malformation of the hair papilla or glands (congenital baldness, ichtyosis, nævi).

(3) Habits, food, hygiene. Certain internal medi-

cations, by changing the normal function of the epidermis, sebaceous and sweat glands, may jointly with the preceding causes constitute a series of effective and predisposing conditions upon which an accidental cause may create a local malady.

Incidental Causes. These are sometimes of internal, but more often of external origin.

Internal Causes. These are often of powerful and efficient character. They result from infection, autointoxication, general disturbance of nutrition. We find diffuse baldness after taking acetate of thallium; acne after iodide of potassium; striped baldness after syphilitic infection; progressive baldness after infectious diseases.

External Causes. These are: (a) lack of hygiene, (b) traumatic, (c) toxic and infectious.

Hygiene Causes. These are trifling, but frequent, absence of proper care of scalp by washing, lack of hygienic or professional care, overwork, too much shampooing, rubbing, massage and fussing with the scalp.

Traumatic Causes. Bad combs, pulling of hair, accidental loss of hair by burning with chemicals or caustics.

Infectious or Toxic Causes. All irritants, as petroleum, fats, chemical compounds, tinctures, all medicines dissolving the horny layer, overstimulating or depriving the hair of oil.

Animal or Vegetable Parasites and Microbes. The vegetable parasites or fungi have always the same effect—the same fungus presenting the same clinical pictures.

With the microbic parasites it is different, as they may occur upon the normal scalp, and again be found

in association with other microbes affecting conditions of a widely different character, baldness, seborrhœa and suppuration, and thus greatly increasing the difficulty of making a distinct diagnosis.

CHAPTER X

TECHNIQUE OF THE EXAMINATION OF HAIR AND SCALES

There are two systems of making examinations of hair and scales: the rapid method in the office or consultation room and the slower method of the laboratory.

The Rapid Method. The instruments required for rapid examination are: A microscope with objective, oculary, of a magnifying power of 300-600, a diaphragm to regulate the amount of light, an alcohol lamp, a solution of caustic potassa, 40 to 100. (Caustic Potash 40 grammes; distilled water 100 grammes.) Slides and cover glasses, a pincette and a forceps.

Method of Collecting Material and Specimens for Examination. The examination must include the hair, scales, detritus and scrapings of the scalp.

The hair must be carefully selected and not taken at random. A poor choice often explains poor success and poor or faulty diagnosis.

One must choose abnormal, broken, twisted or sheathed hair from the periphery or center of the lesion, if there are any. If a first examination proves abortive, look for a hair, situated on a bare spot, which is scaly from the vicinity of a suppurating point or one that is in the center of it.

The hair should be seized at the point of exit from its follicle between the teeth of the pincers, which

must previously be heated and allowed to cool. When you have a good hold it must be pulled out without violence and not too rapidly.

The smoother the epilation, the less jerking is done, the less painful it is. The scales are lifted up by the pincette by taking hold of the edges if they are thick and large enough; otherwise they can be detached by the curette, or even better in the way indicated by Dr. Sabouraud.

Dr. Sabouraud's Method. First two slides are steri-

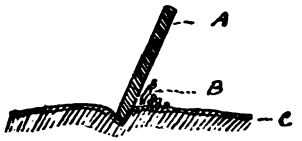


FIG. 102.—Scraper used by Sabouraud. *A*, slide; *B*, scrapings, which are forced out of the follicle-mouths by pressure of the glass slide upon the scalp.

FIG. 103.—Manner of using the scraper.

lized; then one of them is taken in the right hand and placed obliquely to the surface of the scalp, slightly depressing it. In order to collect the epidermic debris more easily the second slide should be placed at an acute angle to the first and below the edge of it, thus receiving the scrapings quite readily. In some cases it is impossible to get a single hair while epilation brings out bundles of them. In such cases needles are used to spread the scales upon the slide. But even this is often insufficient, and in such cases the laboratory must be depended upon.

Technique of the Examination. The hair or the scales are placed upon the slide, which has been previously washed with alcohol and dried, and upon

which a drop of potassium solution has been placed.

It is important to use no more potash than necessary—one or two drops are enough. When the quantity is too small the hair dries up and changes, when there is too much it runs over the edges of the slide, soils the platform of the microscope, and also prevents regulating the heat.

Cover the hair or scales with a coverglass properly cleansed. The whole is held over an alcohol flame,

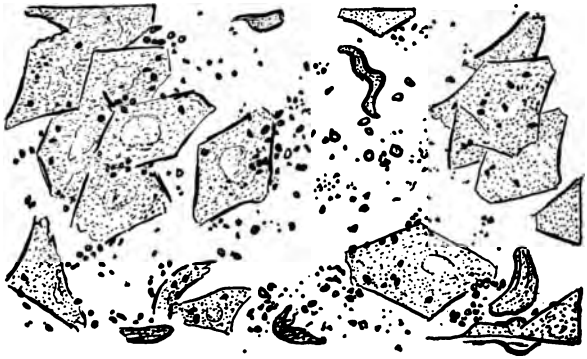


FIG. 104.—Seborrhœa baldness. Scrapings of seborrhœic scalp.

heated gently by degrees. The best method for heating is to hold the slide over the flame and withdraw it several times. After a few seconds air bubbles appear at the border of the coverglass; this shows that the potassium solution is boiling. Then it is necessary to assure oneself by means of the microscope of low power, whether the hair has been rendered sufficiently clear; if so, the examination is made; if not, one heats it again until the bubbles reappear. It is seldom that the heating has to be repeated more than two or three times. The slide is then placed upon the screw table of the microscope.

It is necessary to admit as much light as possible by means of the diaphragm.

At first it is better to examine the hair at low power, afterwards to use the high power. By this means one avoids the possibility of crushing the object.

The prolonged boiling, the crushing of the hair, and

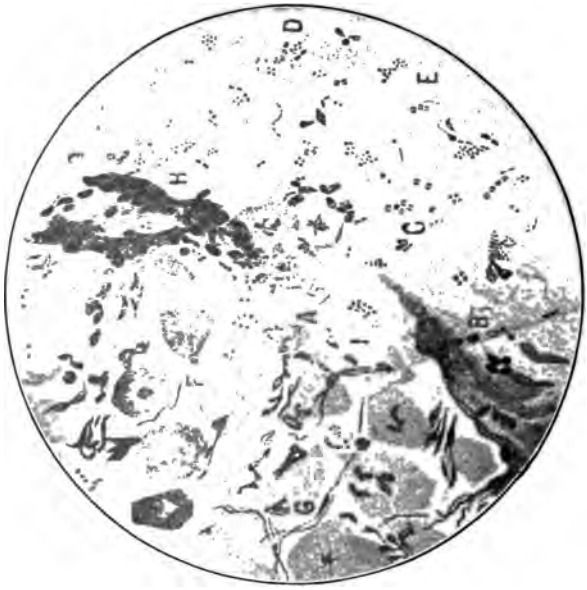


FIG. 105.—Scrapings of scalp under the microscope.

defective illumination often make a successful examination impossible.

Causes of error may be a false interpretation of the objects seen, or changes occurring in the examining liquid.

The existence of air bubbles, particularly of fat globules, vegetable spores, grains of atmospheric dust, the disposition of the lines of the cortical cells or the

presence of crystals may lead into error, but the advance is rapid when care is taken.

It is necessary to make the examination of hair or scales, treated by caustic potash, as rapid as possible, as the fluid disintegrates the structure of the hair in

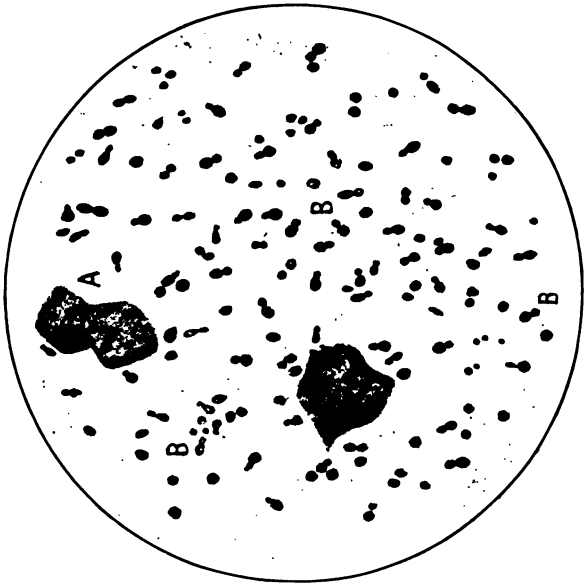


FIG. 106—On this slide we find principally, at A, the bottle bacillus of Unna and at B. the microbacillus of Sabouraud.

a short time and a correct diagnosis cannot be established, unless the relation of the hair and scales with the parasite, that is, its location in the cortical, medullary or follicular portion, can be discovered.

The Slow Method. This comprises a series of manipulations necessary for coloring the microbe. Its true indication is the study of squames and seborrhœic

debris, as the examination of colored hair often proves negative.

Balzer's Method of Examination. Balzer's method is the best of all for coloring hair for the purposes of examination, and is as follows:

Wash the hair with ether.

Put it in a cold solution of caustic potash (40%) for several hours.

FIG. 107.—Bacille à Bouteille.

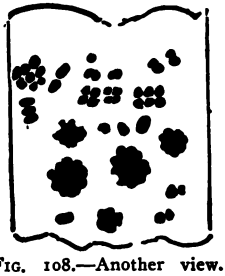


FIG. 108.—Another view.

Wash for a long time in ammonia.

Wash in water.

Color with eosine or methylaniline violet.

Wash in water.

Mount in glycerine.

The eosine colors the mycelian filaments and spores.

Examination of Scales and Scrapings. (After Sabouraud). Crush the seborrhœic matter between two slides.

Wash with ether.

Color at once with polychrome blue of Unna or Loeffler.

Wash in water.

Wash in absolute alcohol.

Dry in air and make a temporary examination after

putting on a drop of cedar oil, or better wash in xylol and mount in balsam.

INFORMATION GAINED BY THE EXAMINATION OF HAIR AND SCALES

Examination of Hair. The aspect of the hair, its implantation, its relation, its adherence or its fragility gives useful information.

Direct Examination by the Eye. This must take place before a window, which conveniently lights up directly or obliquely the head, held straight or inclined. A pair of pincers are needed for epilation and a magnifying glass for close inspection. The following facts must be ascertained.

Whether There Is Hair Loss. The scalp is totally or partially denuded of hair. It is smooth, shiny, polished; the bare spaces are quite round, the periphery showing hairs which look like exclamation points, upper end thick, lower end thinned to a point, a slight depression of the scalp is noted, which may also be found to be loose. These conditions may be general or local, or the entire body may be involved in the hair loss.

In some of the circular bald areas some hair may still be left, more or less atrophied, easily broken, the area itself slightly oily may look like a freshly shaven surface with dark points.

This aspect may be presented in certain cases of trichophytosis (ringworm), but in these cases the hairs are placed apart, longer and when taken hold of break off at the point of implantation.

When we notice little depressions on the surface of the bald spots and examine them with the loupe we

find, in certain cases, that we deal with folliculitis, readily recognized by little scars left behind by the inflammatory and suppurating process.

Where there are larger cicatrices of reddish color, deeper, surrounded by single hairs, adherent and hard to remove, we have a favus which has healed.

Lastly, a lupus erythematosus may be recognized when we see a cicatrix with dentated edge, inflamed follicles surrounding it, the border and cicatrix being decidedly red and angry looking.

In the cases just described the hair loss has been systematic, regular, circular in shape; in other cases the baldness is in irregular form, denticulated with nicks at acute angles. The bald patches are few in number and generally located at one point of the scalp, or general all around, with hair surrounding them which can be pulled out by the handful.

Such conditions are found in those suffering from infection, traumatism, atrophy, and in young children.

Hair loss or baldness may also be congenital, or be brought on by repeated or continuous rubbing of the scalp upon the pillows; it may be situated at the temples, the occiput, or parietal regions.

It may be the baldness of convalescence, senile baldness, due to old age, premature baldness, due to progressive and systematic denudation of temples and forehead accompanied by oily secretion and excessive perspiration.

Whether There Be Scales and Desquamation. When there are bran-like whitish scales, which cling to the hairs like nits, we have pityriasis simplex (dandruff); where the scales are thicker and dry there is seborrhœa sicca, or dry seborrhœa; where the scalp is oily

and the hair falls out easily, there is seborrhœa oleosa, or oily seborrhœa.

Unna's seborrhœic eczema belongs to this group, and is distinguished by grayish, dirty looking scales.

When the scalp presents squames, which may be large or small, shiny, forming little islands of greater or lesser extent, often directly upon the border of the scalp, the hair, however, growing, healthy and unaffected through these scales, we have psoriasis.

FIG. 109.—Seborrhœa plug, follicle disappears.

On the heads of children, one or two circular areas, covered with bran-like dusty desquamation, the hairs irregular in direction, either lying flat or standing straight up on end like bristles, some broken off not far from the place of insertion, slender in appearance, covered with a dusty sheath such conditions show a case of trichophyton tonsurans or ringworm.

Whether There Be Pustulation. If the hair is imbedded in the point of a pustule, which is one of a number, or is isolated, or part of a confluent mass, surrounded by healthy skin, we find it to be folliculitis.

In other cases where the suppuration is always limited, not so evident, the lesion small, like a lentil and situated along the hair border, it is acne necrotica or varioliformis.

In real or sympathetic impetigo we find caked masses, which, when separated are found to consist of epithelium, fat globules, leucocytes, blood globules, crystals, streptococci, micrococci, diplococci and staphylococci.

Folliculities Simplex or Trichophyton. Here we see in the midst of leucocytes and epithelial detritus either the trichophyton endo-ectothrix or the microbes found generally in pus formation, viz., staphylococcus, streptococcus and diplococcus.

The examination of the scalp by the microscope may demonstrate the following microbes: Sabouraud's microbacillus, the bottle bacillus of Unna, the spores of Malassez, morococci, micrococci, streptococci, diplococci, staphylococci and undetermined bacilli of the skin. These different microbes have the following peculiarities.

Sabouraud's Microbacillus. This bacillus has also been known and observed by Unna and Hodara. It is very small, 1/3 of a millimeter broad and ½ to 1 millimeter long. In its barrel-like shape it resembles a coccus. Later on it lengthens, takes the shape of an S and is grouped in bundles. It is colored or stained with thionine.

Unna's Bottle Bacillus, or the Spores of Malassez. First discovered by Malassez in cases of alopecia areata and pityriasis simplex. It is the shape of a Pilgrim's bottle or champagne bottle, sometimes like a short stout club. Seen in small groups or singly.

When a number of little cuplike depressions are

seen, in the center of which a hair is implanted, which resists pulling, having a glassy sheath on the lower portion and a black bulb, which is shiny, these are signs of favus invasion.

When a number of diffuse suppurations with thick dry crust or moist with the hair sticking to it is found, we have impetigo Bockhard.

Examination by the Microscope. This completes the preceding findings made by ocular inspection, and is made in two ways: (a) The extemporaneous with glycerine; (b) the one with potash.

(a) The Extempore Examination in Glycerine. This examination by itself cannot give us a certain diagnosis, as changes in the hair are often the same from a variety of causes.

The technique consists of putting the hair about to be examined into a drop of glycerine covering with a coverglass or slide and examining under low power.

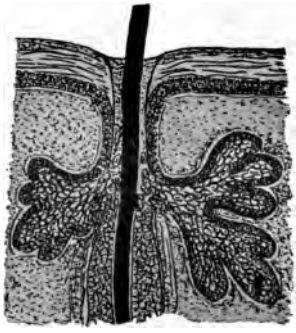


FIG. 110.—Hair in full life.

The Normal Hair. The normal hair is composed of three parts, the only one visible being the shaft of the hair, as it is implanted in the scalp, the others are

completely hidden in the thickness of the epidermal covering, where they occupy the funnel formed by the hair follicle and the root, which is implanted upon the papilla by means of the bulb, swollen and hollowed like a cup at its lower portion, thus grasping and holding the papilla.

When the hair is still living and developing the

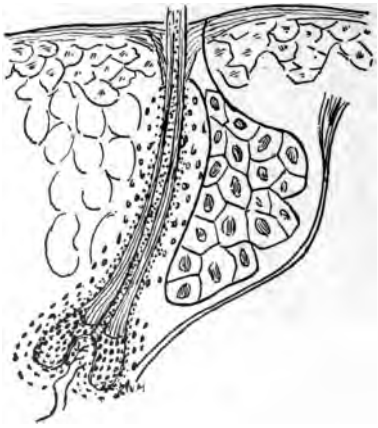


FIG. 111.—Hair and its sebaceous gland.

bulb is hollow; when the hair has ceased to grow and has accomplished its physiological withering process, the cuplike part disappears, the bulb becomes round and is seen as a dark-hued blackish mass with a thin sheath of the nature of epidermis, denticulated on the edges. It is called complete, full-grown bed-hair or beethaar (German).

When examined in glycerine, with 200-400 diameter magnifying power, the whole hair shaft between bulb and extreme point shows an external part, a skin-like covering, formed by overlapping tiles of epidermic

cells, lamellous, without nuclei, without pigment, and which seen from their border side often resemble filaments. Within the epidermic layer is the rind or crust, with nucleated cells, which have pigment and adhere closely together.

The axis of the hair is formed by the marrow, a

FIG. 112.—Another view showing hollow bulb upon papilla.

cord of nucleated cells, round, pigmented, often separated by air bubbles.

In the normal condition and seen with medium power the following is found:

Externally, a clear line, differing little from the part lying next below.

Inside and forming nearly two-thirds of the thickness of the hair, a clear column with fine lines of ir-

regular granulation. This is the cortical portion.

In the center a fine thread, much pigmented, forming the marrow, which seems to end in the bulb as if that were its termination, and which we have discussed above.

The marrow canal has been closely studied by Prof. Felix Pincus (Berlin) and the results of his research, which I have closely followed ever since the fall of 1913, are of great importance. I have described this method in the following chapter.

FIG. 113.—Total baldness in boy.

The microscopical examination permits the recognition of arrested development, malformations, or diseases of the hair.

Examination of Scales. Direct examination informs us as to the form, nature, thickness, color and adherence of the scales. It shows also whether there is any suppuration and whether the same is situated around the hair, localized or diffuse.

Microscopically we discover the presence of epidermic nucleated cells, fat globules, crystals and numerous particles of atmospheric dust.

Among the diseases which we discover by microscopical examination of the scales are the fungoid diseases of the hair.

Trichophyton—Ringworm. In the scaly mass it is seen in the form of filaments and chains. In the latter case the threads spread through and about the

cells. They are thin, long drawn out, slightly flexible and not numerous. The spores are round, ovular and

FIG. 114.—Cut of hair with favus spores.

FIG 115.—Another view.

small, either attached to the filaments or isolated in separate groups.

Favus — Achorion Schoenleinii. Its appearance differs from that of the hair when examined in connection with squames, in that one finds threads by themselves; free, straight, flattened, irregularly ramified, erect or curved; or else threads formed of

FIG. 116.—Achorion schoenleinii, favus.

spores in chains, rounded, oval, twisted and very irregular.

The filaments appear hairy, issuing from masses of heaped up spores without order or grouping, among which are seen in places air bubbles, fat and debris of the epidermis.

Examination of Scrapings from the Scalp. Here we mention Sabouraud's seborrhœic plug or cocoon. When pressure is made upon an oily scalp, there issues from the hair follicles very fine threads, which, inclosed in the canals of the sebaceous glands attached to the hair follicles, constitute what Sabouraud has named the seborrhœic cocoon. It is composed of fat globules, debris of the horny layer of the skin, or many bacilli, also named by Sabouraud, micro-bacillus of seborrhœa.

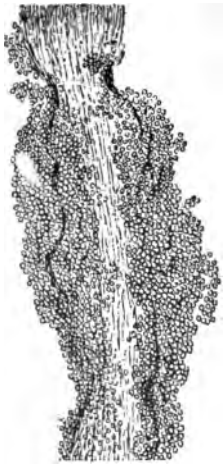


FIG. 117.—Piedra spores which cause the hair to appear knotty.

The diagnosis of the diseases of the scalp is not complete without a careful examination of the marrow-canal by the microscope. The following chapter gives a complete and detailed account of what can be learned from such an examination.

CHAPTER XI

THE MICROSCOPIC EXAMINATION OF THE MARROW-CANAL FOR DIAGNOSTIC PURPOSES

A very interesting part of the anatomy of the hair, of which people in general know very little, is that small fiber running through the center of the hair called the marrow-canal.

The marrow is not contained in every hair of the head; its presence depends upon the thickness of the hair. From this marrow fiber the specialist, by making a microscopical examination, derives information not only as to the health of the hair, but as to the health of its owner.

For this microscopical examination a hair is chosen which is still growing and of sufficient length to show the changes which have taken place in the past year, and which still retains its succulent, soft, unreduced root. If it is possible to obtain one, a white hair should be chosen for this purpose, since it is most likely to contain a distinct air-filled marrow fiber. This marrow is more frequently found in a thick hair than in a thin one. Heads of very fine hair are often entirely without it; however, this deficiency does not indicate any weakness of the hair. In other cases almost every hair will contain this air-filled marrow line.

Often where the pigmented hair does not contain

marrow, the pigmentless or gray hair, which is usually thicker than the dark hair of the same head, is filled with it. In the marrow-filled hair, at least that part nearest to the papilla contains air, while the upper portions are devoid of it because it has been expelled by washing and drying. But the lower more recently grown sections are almost always sufficient to form an opinion on the conditions which will be discussed later.

The absence of the marrow in a section of a hair which elsewhere is marrow-filled, points always to a diminution of the growth of the hair; these parts of the hair did not grow slower, but grew thinner. In the attenuation of the hair which occurs some time before its normal death the marrow fiber disappears very early.

This gradual thinning which precedes the death of a hair which has reached its normal duration of life, and has not been prematurely killed by any sudden cause such as illness, etc., extends about to the last quarter of its length, but may reach even over its entire lower half.

The air-containing marrow fiber, which before was absolutely uniform, becomes somewhat thinner, later is interrupted in stretches and disappears altogether, while towards its root appear very small air-filled longitudinal cracks spread widely in the cuticle.

The normal conditions must be taken into consideration, if conclusions are to be drawn from the abnormal conditions of the marrow fiber. Generally speaking the interruption of the marrow fiber signifies the effect of severe bodily ailment.

This is more easily recognized if the ailment has set in suddenly and lasted only a short time, than

when it begins gradually and is of longer duration. In the first case the hair is only affected for a short portion of its length, which is easily distinguished from the portion of the hair which has recovered its health.

The interruption of the air marrow stands so conspicuously in the foreground as one of the most noticeable symptoms in diseases of the scalp, that it alone is sufficient to enable the physician to form a correct estimate of the threatening loss of hair. Usually after an acute fever, a profuse loss of hair follows; after typhoid, perityphilitis or pneumonia it is almost a rule. This loss of hair is never complete, although often very severe.

However, a certain number of hairs survive, and from their marrow-canal the time and duration of the illness may be ascertained.

If a number of strong, apparently well-grown hairs containing the marrow-canal are examined at the beginning of an acute infectious disease, it is easy to find among them some which have not so far been changed by the sickness.

If an examination be made every seven days it will be seen that on the first day the marrow-canal extended into the root, on the eighth day for about the space of an inch above the root there will be no marrow, on the fifteenth day the stretch containing no marrow will have increased to nearly three inches above the root, and on the twenty-second day (under the assumption that the fever last exactly fourteen days) there will be again a stretch of a little more than an inch containing marrow, then again about three inches without marrow, then once more the normal marrow; on the twenty-ninth day marrow again for

a distance of nearly three inches, then for three inches no marrow, then the normal marrow again and so on.

After three months' time, measuring from the root up, there will be found for about seventeen inches air-filled marrow, then the stretch of three inches without any marrow, then once more the normal marrow.

The stretch without marrow, which corresponds to the duration of the illness, can be recognized on long hair for a considerable time. Hence, the hair gives a strictly objective anamnesis and for a much longer period than do the changes of the nails (the well known Beau lines running horizontally across the nails, which remain visible for three or four months, and correspond exactly with the deterioration of the hair.)

The alterations of the hair, just described, by which the date and duration of an illness may be accurately ascertained, may be of much importance, sometimes even in legal cases.

For our research work regarding the loss of hair they are of first importance. Their presence points to the origin and prognosis of a scalp disease under treatment; the falling out of the hair in question is nothing but the beginning of restitution, a kind of moulting after a sickness, analogous to the well-known desquamation of scarlet fever, typhoid and other infectious diseases. The absence of these alterations of the hair means that the falling out of the hair has not so clear an origin.

CHAPTER XII

TREATMENT FOR HAIR LOSS IN GENERAL

If in the treatment (therapy) of hair loss, we observe the conditions which nature herself has given us, and which should serve as a basis for a certain procedure, we shall draw two facts therefrom.

(1) Hair loss is the result of the operations of a toxin. This is often a species of bacteria or a body resembling bacteria. On the other hand, the toxin which restrains the growth of hair may, under some circumstances, be due to the ductless glands. If we do not identify the injurious bacteria, we cannot base the treatment upon that theory, and only a specific opsonin (gland extract) therapy could be considered. The toxin would have to be examined as to its relation to the gland involved, thyroid, suprarenal or hypophysis, and a corresponding extract used for treatment of the case.

(2) An inflammation of the scalp ordinarily accompanies loss of hair. Although this may not be the primary symptom, but occurring through well-known causes as a concomitant with it, it is the visible anatomical change which we can take under observation.

(3) The special therapy must therefore, remain empirical or as experience dictates. The two points towards which it must be directed are, first, the strengthening of the whole constitution and the avoidance, if possible, of taking on fat, as we have observed

that with increasing weight there is a decrease of the hair growth.

In all cases, where there is no contrary indication (which would be particularly a disturbance of the stomach and intestines) quite small doses of arsenic, preferably in the form of a saturated arsenical acid, may be used.

Acidi arsenicosi 0.1
Sodii bicarbonici 1.0
Succi liquiritiae
Pulveris radicis liquiritiae.....ana 2.0
M. F. pilul. Nr 50
D. S. 1 pill three times daily after meals.

It is never necessary to increase the amount of arsenic; it may be taken six times daily if necessary to increase the energy.

Iron and quinine may be given at the same time if deemed best by the physician.

Accompanying this treatment the care of the scalp is very important.

Here the question arises which is the better—an energetic, circumstantial and hence a short treatment, or a more moderate one, which may have to be continued for years, arriving gradually at the desired results.

As violent means, such as energetic washings, massaging, and rubbings with ointments, etc., appear to do more harm than good, it would seem as if the latter course were more to be recommended. Powerful irritants only increase any inflammation that may be present.

The wonderful cures sometimes heard of are generally the brilliant results following the treatment

for acute hair loss. Usually the "cure" is the increased growth of hair, which would naturally follow the preceding loss of hair, and which will cease in a few weeks. In such cases there is nothing more serious to overcome than a slight torpor and relaxation of the scalp, and by thorough cleansing prevent the formation of seborrhœic crusts.

The following method (Prof. Lassar's) which is well known among dermatologists is given, not because it is to be so highly recommended, but because it should be mentioned in this place.

Prof. Lassar's Treatment. Washing: For about 10 minutes rubbing with soap and hot water, afterwards a thorough drying with hot towels.

Disinfective:

Sol. hydrargyri bichlorati.....0.5; 200.0
Glycerini
Spiritus coloniensis ana..... 50.0
M. D. S. Hair Lotion

After a few minutes' friction of the scalp with

Beta-naphthol 0.25-05
Alcohol absolut. 200.0

The head should be rubbed with this hair lotion till quite dry and in condition for the following oiling.

For oiling:

Acidi salicylici 1.0
Tinc. benzoes 2.0
Olei provincialis .....ad 50.0

Lassar.

Local Care. The local care of the hair consists of many but quite simple measures. Daily rubbing of the scalp with a strong mixture of spirits, as follows:

Acidi salicylici	5.0
Olei racini	3.0
Spir. vini rectif.	ad 200.0

The rubbing is to be done daily, either with the hands, or still better, with a wad of cotton, or with a clean sponge, and should not be continued more than one or two minutes. The lotion should be poured into a flat dish, a tablespoonful at a time, the cotton dipped into it and rubbed in, the hair being parted so as to facilitate its application. Where the head is too wet, it should be dried with a soft towel, and those parts which have not been thoroughly moistened one day must be done again the following day. Those places on the back and crown of the head where there are the most scales must be done most carefully.

The following recipe is much in use:

Acidi salicylici	3.0-6.0
Olei ricini, for women	2.5
(for men, more)	10.0
Olei bergamotti	
Absolute alcohol	ad 200.0

This mixture, with the addition of some good eau de cologne, is of value where there are many scales and itching of the head (which shows that the skin of the head is sensitive). Only in quite exceptional cases does the alcohol seem to produce much burning sensation, particularly at first, but if it does a milder

lotion may be used. For this purpose the following may be substituted:

Sol. sodii bicarbonici.....4.0;	150.0
Spiritus lavandulae	
Spiritus melissae .....ana	25.0

It may be made with more of the spirits. By continued use a reddening of the hair may be noticed, especially with blonds. The following mixture is than to be recommended:

Amyli nitrosi guttae.....	XX
Solut. Fowleri	1.0
Spiritus vini 100.0	
Ag. destillatae	95.0

For a continuous use very often other formulas must be used, and continuous use, as has been remarked before, is one of the principal necessities in treating chronic hair loss. As it has been found impossible to effect any fresh regrowth of the old hairs as they do not grow at all or are approaching the end of their life, we can only expect an improvement in the new hairs which take their place, and this growth requires from 2 to 4 years for its accomplishment.

The above statement is practical as well as theoretical, but such advice is generally not taken seriously by patients, and they give up the simple care of their hair as soon as they notice a slight improvement in its condition.

A simple treatment of the hair by the use of hair tinctures should be as easy for a person as the brushing of the teeth.

Hair tonics which may be constantly used are:

Resorcini 5.0
Ol. ricini 3.0
Spiritus vini rectific. .....ad 200.0

To conceal the odor of alcohol, a few drops of etherized oil may be added. An addition of ½-2 grammes of pyrogallol is to be recommended, but this, as well as the resorcin mixture, can only be used by persons with dark hair.

For blond hair the following is better and by far the best mixture:

Camphoris .....3.0 up to 10.0
Chloral hydrat. .....5.0 to 10.0
Spiritus vini rectific. .....ad 200.0

With the addition of some eau de cologne, or for deodorizing, the camphor and increasing the irritating effect, liq. ammon, caustic 5.0 or menthol 1.0.

For very oily hair (but hair is not usually very oily): Formaldehyde solut., 1.0-5.0, or tincture of cantharides, as much as 10.0 may be added and produces a very effectual irritation.

If these last mentioned additions irritate too much, they should be added gradually and carefully, and if they produce itching they should not be added at all.

It may be proper here to observe that unknown mixtures very often cause inflammation of the scalp and skin of the face, particularly when used by persons having over-sensitive skins, just because they contain the above mentioned ingredients.

Much weight is usually given to the style of wearing the hair that fashion decrees, the doctor having very little influence upon this question.

Crimping, fluffing, singeing, braiding and twisting

the hair scarcely interfere with its growth, although they make it brittle from their drying effect. In order to obviate this brittleness, oily substances should be rubbed in (strong brilliantine) or the following liquid may be rubbed in:

Acidi salicylici	5.0
Olei ricini	10.0
Spiritus vini rectificati	ad 100.00

Twice daily this should be applied by dipping the brush in it and passing it over the hair.

For overcoming alopecia areata however, none of the remedies mentioned will suffice. True, in many cases, after persisting for months the greater number of bald spots disappear gradually. In other cases, however, they may continue for years, without showing the least inclination towards voluntary recovery.

Experience proves that the spots of alopecia areata will produce hair more certainly, if they are kept in a constant state of irritation, either through hyperemia or even by a slight inflammation from moist heat.

Any remedy producing this congestion of the scalp is good but the best is chrysarobin, which seems to have a specific effect. Each place should be rubbed twice a week with strong chrysarobin ointment (Unna's) and besides this the entire head with a strongly irritating hair spirits. As chrysarobin is apt in many cases to color the bed linen and collar, and therefore cannot be used, some other remedy must be substituted for it. Tincture of iodine may be used, but it too often colors the hair in its vicinity an ugly yellow. Rubbing with acid carbol liquefactum produces good irritation, causing a superficial scab, which falls in about ten days.

Among physical means the faradaic current, is of great use, particularly in cases of protracted alopecia. In many cases the irritating effect of the Finsen lamp and still better that of the quartz lamp are particularly favorable. (See chapter on Phototherapy.) The fundamental principle is the production of a permanent hyperæmia, by whatever means it may be produced.

CHAPTER XIII

THERAPY AND FORMULARY FOR THE USE OF PRACTITIONERS ONLY

Abscess of Scalp. Treatment, surgical in case of large abscess; cautery for small ones; antiseptic spraying with borated or carbolic solutions followed by moist aseptic applications.

Acne. Can often be cured by the use of the white precipitate ointment (2 per cent.) or by unguentum carbonis detergens, but warn the patient that there may be a relapse and that it takes time to eradicate the disease. Disinfectants must be used on scalp and combs, brushes and everything coming in contact with scalp. Ac. carbolicum, thymol, camphor oil, gaultheric, etc.

Acne Keloid. Cautery must be employed after the hair has been removed by epilation, and scarifying should be followed by antiseptic washes and mercurial ointments (red iodide of mercury of the strength of 10-20 per 100) applied. Phototherapy with radium. Also with the Kromayer quartz lamp.

Acne Varioliformis (necrotica, frontalis). White precipitate ointment is to be rubbed in for a few days or unguentum carbonis detergens.

The acne will then heal but the patient must be informed that new attacks may be expected and may keep up for years.

Strict hygiene as recommended in seborrhœa sicca

will lead to complete recovery if strictly adhered to.

If the healing is slow and sluggish, phototherapy by means of the quartz lamp should be used for a few times.

Alopecia Areata. The modern treatment of this disease is now entirely given over to the phototherapy since Nagelschmidt was able to report in 1913 that of 104 cases he cured 96 and four of the latter were suffering from alopecia totalis. (See Phototherapy). Where such treatment cannot be obtained application of the following irritants is recommended.

Phenic acid	4.0
Acetic acid	2.0
Alcohol	
Glycerin	aa 50.0

After this is applied and evaporated use this salve:

Vaselin	21.0
Salol	1.0

Herxheimer cured 80 per cent. of his cases (150) by applying lithanthrol to the denuded scalp. This is to be applied until a thick crust forms. The new hair grows through this crust. The treatment is objectionable to patients, who have no facilities of hiding the ugly dark brown coating on their scalp. Eyebrows and beard can of course not be treated by this method.

Other remedies much praised are pure carbolic acid used in the Skin and Cancer Hospital, New York, with satisfactory results.

Alopecia Prematura. See Prophylaxis and Hygiene, as it is of the first importance to learn the ways and means to prevent further loss of hair.

Parents should look after their children, especially if they themselves suffer from baldness or loss of hair.

Maintain fullest vigor of body, although in spite of it the hair loss may continue for some time longer. If anæmia be present iron, cod liver oil, phosphates and tonics must be given.

Live in the open air, sleeping with window open, playing tennis and golf, climbing mountains in vacation time.

Breathing properly by practicing deep in- and exhalations when walking the streets.

See that offices and work rooms are well ventilated.

If the scalp is held down upon the underlying cranial bones, massage must be applied. The patient should do it mornings and evenings until he feels the scalp getting more movable and pliant.

To increase the blood supply brushes should be used which have longer bristles in the center than in the circumference.

Electricity by the D'Arsonval-Tesla high frequency current is very useful. It is applied by a monopolar flat glass plate electrode, or with women and men with long hair a glass comb. Five to ten minutes of a one inch spark will cause a sufficiently erythematous condition to do good. (See illustrations No. 92-97.)

More effective yet by far, is the use of the Nagelschmidt quartz lamp, the use of which is clearly described in my book, "Loss of Hair and the Quartz Lamp Treatment" (W. R. Jenkins Pub.). There also the wonderful results are accurately and truthfully shown by photographic illustrations. After having personally used this method for three years, I can recommend no other as better.

Prof. Jackson recommends besides the pilocarpine mixture as seen below:

Acidi acet.	16.0
Pulv. borac	4.0
Glycerin	12.0
Alcohol	16.0
Aquae rosae	aa 250.00

Alopecia Senilis. Here the general health is of prime importance. Tonics must be given, the diet well regulated. Invigorating food ordered. Gouty diathesis must be corrected.

The scalp should be shaved at intervals. Static electricity, the quartz lamp treatment, as often as once every 2-3 weeks, continued for at least 12 months. Jackson's mixture is:

Pilocarpin muriat	1.33
Spiritus odorati	16.0
Aquae rosae	
Alcohol absolut	aa 250.0 misce.

This must be rubbed in with the finger tips mornings and evenings. A soft tooth brush is a good means to apply it. Use no more than necessary to wet the scalp. If alcohol dries the hair too much use a little olive oil (℥i) or sulphur cream to rub in. (See also chapter on Chronic Loss of Hair.)

Alopecia Syphilitica. Here the specific treatment is of first importance. Local treatment consists of application of the following lotions and salves:

Distilled water	300.0
Bicarb. of soda	
Borax	aa 1.0

Rub in this ointment:

Salicylic acid 1.0
Sulfur praecipit. 10.0
Lanolin
Vaselin, pure .....aa 50.0

Aplasia, Monilethrix. Treatment is of little avail. Stimulation may be tried. Some authorities recommend washing the scalp every day with green soap, saturating it at night with a 2 per cent. solution of salicylic acid in castor oil, and wearing a rubber cap.

Barber's Itch or Sycosis. Local treatment is of more importance than general treatment. Epilation must be done regularly, and the application by rubbing on ammoniate of mercury or a sulphur salve to which may be added resorcin, brings about an improvement. If large abscesses have formed, they must be cured by incisions and hot compresses. Usually years are required for the complete cure, and the patient should be informed of this.

Roentgen rays, which here must be applied very carefully, sometimes give brilliant results, sometimes they not only fail to cure, but produce scars.

Burns. Carron oil should be applied at once, later on, compresses of picric acid 1 to 100.

Eczema Seborrhoicum, Unna. If the eczema is dry and scaling, oozing, crusting combined with impetigo pustules the hair must be cut short, the inflammation subdued and the bare surface treated with moist hot poultices, sprays of antiseptic solutions, rubber tissue covering the diseased parts.

This tissue after two to four hours must be removed, washed in cold water and reapplied. If the

patient cannot bear the same, moist compresses may be placed beneath the rubber.

Daily rinsing of the parts with weak antiseptic lotions.

Erysipelas. External treatment.

The use of creolin, carbolic acid, bichloride of mercury, alcohol, tr. iodine has not filled the expectations of the determatologists who abandon them to-day after trial long continued in stronger and weaker concentrations. They have been used as lotions, tinctures, salves and ointments, injected or rubbed into the scarified skin.

Of all the chemicals tried ichthyol in ten to fifty per cent. salves or collodion mixtures, stands the best chance of continued use, although high authorities object to its dying the affected parts deep brown, making observation of them impossible.

Compresses of liquor aluminis acetici 1 part to 9 parts of water, aqua plumbi, boracic acid, sol., and such ointments as 2 per cent. bor. vaselin are widely used. Adhesive plaster cut in strips and applied along the borderline of the erysipelas, hyperæmia produced after Prof. Bier's method, hot air from an alcohol lamp led into a tin pipe and directed against the inflamed skin, electric hot air by means of an apparatus called Föhn—all these measures are in use nowadays and give much satisfaction in some cases and dissatisfaction in others.

Serum Treatment.

There remains the mention of the Serumtherapy, which has caught the favor of our medical men in the last four years.

The use of Merck's (Darmstadt) antistreptococcus serum for intravenous injection has produced favor-

able results in many cases and there is reason to hope that at last some reliable remedy has been found for combatting this serious disease.

The loss of hair caused by erysipelas needs no special medication as the hair returns after the illness is over. In order to stop the excessive drying of the scalp we like to employ a lotion which will replace the dried up secretions and stimulate the return growth of hair.

Tincturae chinae 10.0-20.0
Ol. ricini 2.0- 5.0
Spir. vini .....ad 100.0
M. S. Hair Lotion—Rub in scalp gently.

Favus. Wash scalp with hot water and green soap and immediately afterwards proceed to epilation and apply tincture of iodine or bichloride of mercury solution, the former diluted one to four, the latter as a one per cent. solution. This must be repeated daily in the same sequence—wash with green soap, epilate and apply the solution.

The good results of this treatment being due to the epilation, we can shorten the cure by the use of Roentgen rays, which will save the physician the extremely tedious and disgusting work of removing the single hairs from the centers of the scutula. The Roentgen rays do this in one application and many cases are cured thereby, although it is known that the rays do not kill the achorion schoenleinii, but merely remove the means of spreading the disease.

Folliculitis. (See also Acne, Impetigo.) The seat of the trouble is the follicle, as the name implies. The Paquelin cautery and antiseptic lotions are really all that is necessary. It is safer to remove the hairs from the diseased follicles.

A LOTION		A SALVE	
Chloral	3.0	Sulf. subl.	5.0
Phenic acid	1.0	Lanolini	
Glycerine	60.0	Vaselini	aa 20.00

Gumma. Use internally specific therapy, mercury and iodides and salvarsan injections.

Apply externally lotions of bichloride of mercury, 1 to 1000.

Ichthyosis. Remove the scales with alkaline lotions, or soap and hot water, rubbing in oily mixtures. Apply ointments of vaseline and 2 per cent. salicylic acid, or of either of the following ingredients:

Sulphur	5%
Ichthyol	5%
Resorcin	5%
Naphthol	5%
Sulphur precip.	2.0
Olive oil	20.0
Tinct. of benzoin	2.0

Impetigo Bockhardt. First treat the folliculitis present, afterwards the crusts of coalescent ulcers like impetigo.

Keratosis Pilaris. The vigorous use of soap and water in an alkaline bath will promptly remove the papules. The best soap for this purpose is green soap, and it may be used in the form of a tincture. A vapor or Russian bath may be used for the same purpose. After the bath the skin should be anointed with oil, vaseline, lanolin or any emollient. In some cases it may be necessary to use a mercurial ointment such as:

Hydrarg. amm.	1.3
Hydrarg. chlor. mitis	2.6
Vaselin	52.

M. ft. ointment.

The following sulphur salve is an efficient remedy.

Ac. salicylici 1
Sulphur precipitat 4
Adipis. anserini 32
Ol. rosar .....gtt 10 m.

Sulfur praecip. 10.0
Alcohol 90%
Aquae destill
Aquae Ros .....aa ad 120.0
(Sabouraud)

In obstinate cases of impetigo Bockhardt use:

Resorcin 1.0
Ichthyol 10.0
Aquae dist. 100.0

Impetigo Contagiosa. The quickest relief is gained by the employment of some mercurial ointment such as

Hydrargyri Ammoniati 8.0
Unguenti simpl 25.0

Lupus Erythematosus. This very important scalp disease needs our whole attention, as it is frequently seen and destroys a good deal of hair irreparably.

Local treatment is most important. It is best to use at first mild methods, such as the solution of liq. aluminis acetici, 1 part to 9 of water, aqua plumbi, two to five per cent., boracic ac. sol. These will do as long as erythema is present. If there is scaling at the same time, we remove it by two to five per cent. salicylic acid ointments. The latter should be applied at night and left on till morning; the former is to be used during the day.

If necessary we strengthen the ointment by adding 5 to 10 per cent. sulphur or two to five per cent. resorcin to the salicylic acid ointment.

Mercury in the form of plasters should be used twice daily, and painting the parts with tincture of iodine is beneficial.

Hollander combines with this latter method internal medications of large doses of quinine in the following manner:

In order to establish the fact that no quinine-idiosyncrasy is present, the patient is given small doses of quinine to begin with, for example three times daily 0.5 quinine hydrochloricum or sulphuricum. Five or ten minutes later, but only twice a day, mornings and evenings, the affected part is painted with tincture of iodine several times in succession.

After employment of this treatment for five to six days, a pause is made to allow the crust which has formed to peel off.

If the reaction has not been strong enough, the dose of quinine can be increased. This can be repeated for several months.

The success of this method has been explained by the favorable effect of the combinations of quinine and iodine upon the affected parts. If any time during the course of treatment inflammatory symptoms reappear, the application of the above described milder remedies is again resorted to, until these symptoms disappear again.

Paquelin's Cautery has been employed by Lassar with much success. The surface in this case is not burnt deeply but only touched with delicate strokes by the cauterizer. Healing of the slightly burned skin is promoted by iodoform or liq. al. acetici solution. The process must be repeated several times.

Naturally everything must be done to improve the general condition of the patient. Fresh air, good feed-

ing, internal administration of iron and cod-liver oil.

Ringworm. The therapy of ringworm demands that the hair should be cut, energetic washing with soap, and rubbing with benzine. Very much to be

FIG. 118.—Ringworm affecting dog (Dachshund).

FIG. 119.—And his mistress.

recommended is the epilation of the hair on the affected places, very difficult to carry out however, where there is a large extent of the disease. Many cases succeed without epilation; while in others Röntgen rays may be resorted to. Two hundred cases were treated by Dr. F. E. Jones, Birmingham and 174 were cured after one application of the rays; 26 had to be rayed a second time to be cured. It is important to

remove every hair from the diseased area before the Röntgen rays are applied. This is necessary in favus and microsporia as well as in trichophyton or trichophytosis.

The best remedy is 10 per cent. chrysarobin salves. The salve should be put on thick on the shaved or closely clipped scalp, three times a day, till it is greatly irritated and peels. Be careful of the eyes, as conjunctivitis is easily produced by this remedy.

After the disappearance of the irritation and peeling, the chrysarobin salve rubbings must recommence. Tr. of iodine should also be tried.

Iron and arsenic are needed for the anæmic; stomach and digestive organs must be well taken care of. Big doses of quinine given continuously.

Lastly, a good percentage of ringworm patients have been cured by vaccine prepared from the growth of the cultures made of the fungus. The method reënforced by local treatment to arouse the anti-toxic elements of the blood will effectively antagonize the fungus toxin and help us to successfully treat these cases. Dr. Strickler of Philadelphia treated in this manner 20 little boys, 14 were absolutely cured, 2 improved but still under treatment, 3 improved but left before cure was accomplished, 1 died from measles and pneumonia.

The Vaccine Treatment of Ringworm. The vaccine treatment of ringworm of the scalp rests on the fundamental fact that, in the blood of children suffering from this affection, there is a specific antibody which produces a positive complement-fixation test and gives a positive skin reaction.

Dr. Kolmer and Dr. Albert Strickler found 78 per

cent positive fixation tests in children suffering from tinea tonsurans. This work was done with controls, not only against various dermatologic affections, but also against syphilis, all of which controls were negative. In performing this reaction, the ringworm fungus was used as the antigen. We inject 0.05 c.c. of a suspension of dead ringworm centrifuged at low speed, so that it is of about the same density as luetin. When we inject it into the superficial skin layer of the arm of children suffering from tinea tonsurans, we obtain reactions in the vast majority of patients with ringworm, and negative results in our controls. In only one instance did we obtain a slight positive result in a case of severe staphylococcic infection. The reaction occurs about twenty-four hours after injection, and a positive result consists in a central nodular area of infiltration and a surrounding reddened areola.

FIG. 120.—Ringworm.

Having demonstrated these two fundamental phenomena, namely, the positive complement-fixation test and the occurrence of a skin reaction in ring-worm of the scalp, it is felt that we have evidence beyond peradventure of a doubt that the ringworm fungus elaborates a specific substance which gets into the circulation of patients suffering from tinea tonsurans. The fact that there is a specific substance in the serum of these

patients indicates the rationale and value of vaccine treatment of ringworm of the scalp.

From an experience with this method of treatment extending over one year, I may conclude that tinea tonsurans is curable with vaccines beyond a doubt. Although my record of cases is still small, I firmly believe that the vast majority of patients suffering from ringworm of the scalp can be cured by this method alone.

As Allen has aptly said, in addition to the vaccines, sufficient blood supply containing antitoxic material must reach the area of infection before we have what are considered ideal conditions for the success of this method of treatment. It is felt, therefore, that in recommending some form of local treatment after sufficient vaccine had been administered to arouse the antitoxic elements of the blood, so as to antagonize the toxin of the ringworm fungus, we establish as near as possible an ideal condition, although the results quoted in this paper were obtained by vaccines only, without the aid of local therapy, the object being to give this mode of treatment a crucial test before recommending it to the profession.

FIG. 121.—Baldness due to severe illness, nephritis scarlatina, etc.

It is therefore to be seen that we have in the vaccine treatment of ringworm of the scalp a safe and efficient method of treatment, one that can be carried

out at home, that is devoid of danger and that can accomplish a cure in a comparatively short space of time. The Roentgen ray method, while efficient, can be carried out only by an expert, requires expensive apparatus, and may lead to a permanent alopecia, which, in the case of a girl, would be a most distressing disfigurement. From my experience the Roentgen ray possesses no advantages over the vaccine method of treatment. (See also illustrations 66 and 67.)

Lupus Vulgaris. This tubercular affection is rarely seen on the scalp and when it does appear it is an extension of the disease attacking other parts of the head. The treatment, enucleation, is purely surgical and need not be detailed here.

Warts. They are more annoying to the patients than a disease. They are removed by the scissors or curette.

GLOSSARY

Achorion—Germs of fungi, Achorion Schoenleinii produces favus in mice and men.
Alopecia—Natural or abnormal deficiency of hair.
Alopecia Areata—Baldness in circular patches.
Alopecia decalvans—Complete baldness.
Anamnesis—The history of a case furnished by the patient.
Area Celsi—Alopecia Areata, a form of baldness leaving only a corona of hair.
Atrophy—A wasting away or diminution in size.
Atypical—Irregular, not typical.

Beau Lines—Horizontal lines seen on nails after severe illness, first described by Dr. Beau.

Canities—Whitening of the hair.
Congenital—Originating or existing at the time of birth.
Cortical—Pertaining to, or originating from the cortex.
Cortex—The outer layers of an organ.

Decubitus—Attitude when recumbent, paralysis due to pressure on a nerve from lying long in one position.
Desquamation—The act of scaling.
Diaphanous—Transparent, pellucid.
Diaphragm—A separating muscle, a thin partition.
Diathesis—A congenital condition of the system, rendering it peculiarly liable to certain diseases.
Distrophic—Perversion of nutrition or of trophic processes.

Ecchymosis—The extravasation of blood beneath the skin or mucous membrane.
Ectodermically—Outside of the derma or skin.
Empirical—Obtained or regulated by experience only and not by reason.
Eosine—A red aniline dye.
Epidermis—The outer layer of the skin.
Epilation—Plucking out a hair by the roots.

Epithelial—Consisting of or pertaining to epithelium.
Exfoliation—Peeling off in thin large layers.

Favus—A contagious disease of the skin due to a fungus.
Filament—A thread or structure resembling one.
Follicular—Pertaining to, or affecting follicles.
Frontal bone—The bone forming the forehead.

Ganglion—A well-defined aggregation of gray nervous matter.
Gastrointestinal—Pertaining to both stomach and intestine.
Gumma—A tumor peculiar to the tertiary stage of syphilis.

Herpetiform—Resembling herpes.
Histological—Relating to the study or description of tissues.
Hygroscopic—Attracting moisture.
Hyperæmia—Excess of blood in a part, due to increase of flow.
Hypophysis—A process of outgrowth.

Ichthyosis—A disease in which the skin becomes scaly and thickened.

Keloid—A neoplasm of the skin, consisting of dense whitish or reddish nodules or ridges.
Keratosis—The formation of a horny growth, a disease of the skin, characterized by such a growth.

Leucocytes—An animal cell consisting of a colorless, granular, globular mass of protoplasm.
Lichen ruber—A chronic disease of the skin, in which it is covered with small red, itching papules.
Luftlücken—Air bubbles found in the marrow canal of the hair.
Lymphogranuloma—A tumor of a lymphatic gland.
Lymphosarcoma—Sarcoma of a lymphatic gland.

Matrix hair matrix—Hair papilla.
Medullary—Pertaining to the medulla (marrow).
Mesodermic—Within the skin.
Methylaniline—A staining mixture.
Microbacillus of Sabouraud—A microbe described by Sabouraud and said to be the cause of seborrhœa.

Mycelium—Collection of filaments forming the vegetative part of a fungus.
Morococcus—A germ causing disease of the scalp.

Naevi—Moles, a pigment in the skin.
Necrotic—Pertaining to necrosis, death of tissue.
Neurasthenia—Nervous weakness, a functional disturbance of the nervous system.
Nucleated—Collected round the center of a cell.

Occiput—The lower and back part of the head.
Ocular—Part of the microscope called eye-piece.
Opsonin therapy—Healing with extracts of glands.
Oscillations—The moving like a pendulum.
Otitis externa—Inflammation of the external ear.
Otitis media—Inflammation of the middle ear.
Ovular—Egg-like shape.

Papilla—A nipple shaped prominence papilla of hair is the knob like growth at the bottom of the hair follicle upon which the hair bulb fits and develops.
Periauricular—Around the ear.
Physiological—Pertaining to physiology.
Pigment—Coloring matter.
Pityriasis—A skin disease with branny desquamation.
Prophylaxis—Prevention of disease. Preventive treatment.
Protoplastic—Pertaining to or having the nature of protoplasm.
Pruritus—A peculiar itching sensation of the skin.
Pyrogenic—Producing fever.

Retroauricular—Behind the auricle (ear).

Scleroderma—An acute or chronic hardening of the skin.
Spores—The reproductive cells of one of the lower organisms.
Streptococcus—Germs with spherical cells arranged in rows.
Suprarenal—A small body placed over either kidney.
Sudatory gland—Sweat gland.
Syphilides—A cutaneous manifestation of syphilis.

Therapy—The science and art of healing, treatment.
Traumatism—The state produced by wounds or injuries.

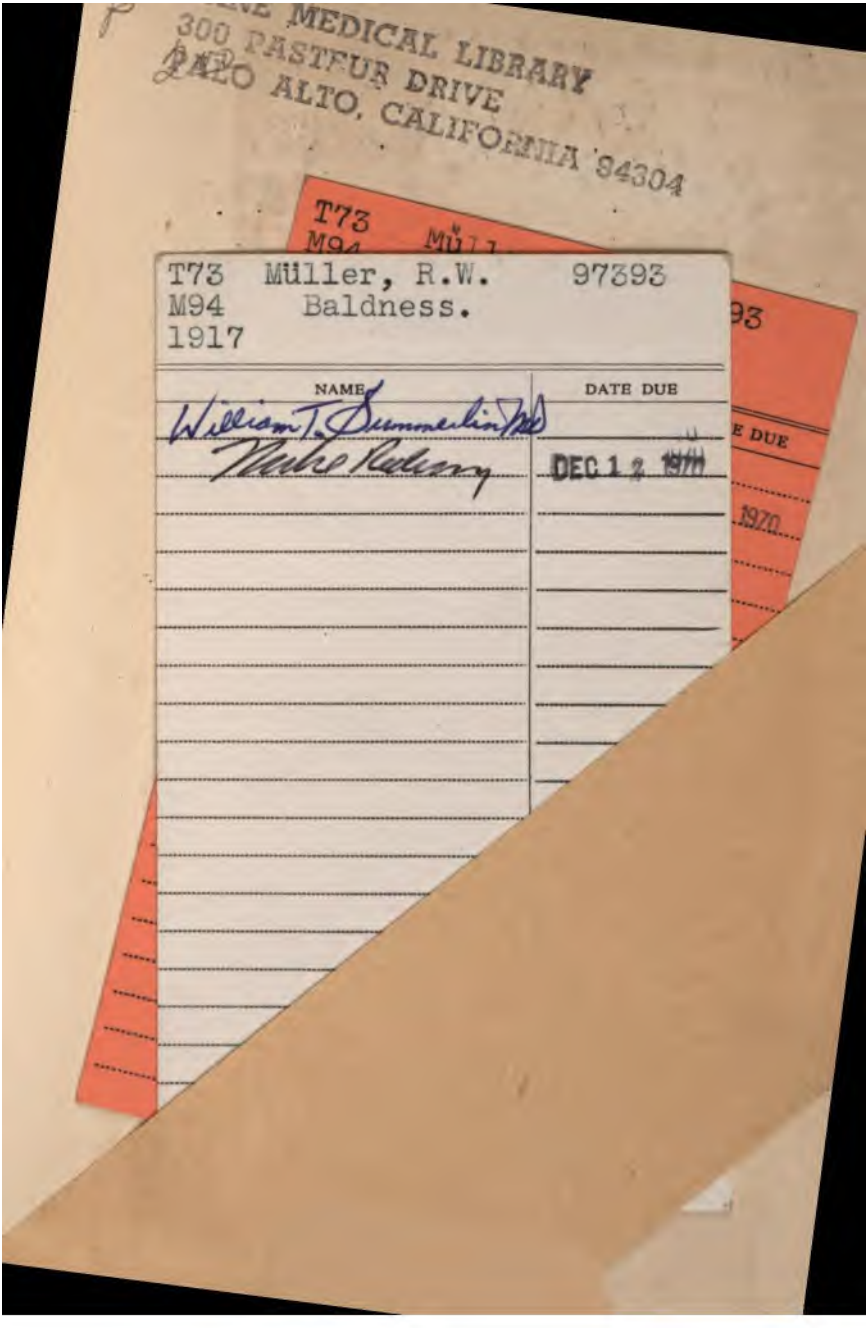
Thyroid—Shield-shaped cartilage forming the front and side of the larynx.

Toxine—A poisonous base produced by the action of bacteria upon organic substances.

Trichopathy—Any disease of the hair.

Trichophytosis—The disease caused by the trichophyton, *tricho* from *trix*, the hair, *phyton*, the plant, hair plant.

Visceral—Pertaining to the abdominal organs.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